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The newsweekly of enterprise network computing

NetworkWorld

February 1, 1999 Volume 16, Number 5 www.nwfusion.com

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OVERVIEW

Over the past 10 years, tremendous investment has gone into the development of management systems for enterprise networks. Yet many challenges such as cost of ownership, complexity of use and lack of real solutions to critical problems have gone unresolved. These challenges force you to direct your attention and resources to important issues including managing security and continuous upgrades to the network, finding and resolving problems immediately, lowering the cost of operations and support, and managing to agreed service levels. And as your enterprise becomes ever-more dependent on your network and access to the Internet, careful and measurable network management becomes more and more critical.

The combined power of Network World, Northeast Consulting Resources, Inc., and leading network management solution providers has produced a compelling program — **Practical Solutions to Managing Enterprise Networks: Getting the Network Management Payoff** — that will help you understand how to meet those demands and implement successful enterprise network management in a practical and effective way.

This FREE seminar is a "must" if you need to:

- Get practical pointers on creating a plan for enterprise network management that delivers results
- Learn how to lower the cost of operations and support through improved enterprise network management
- Understand the latest directions in systems and service management to accommodate future change
- Find out how Web technology can deliver effective integration of management tools and databases
- Contrast the approaches of leading enterprise management products and vendors to aid your decision-making process
- Discover how to leverage your existing network management infrastructure for improved management capabilities
- Develop a prioritized list of improvements you can apply immediately to your management infrastructure
- Probe leading vendor executives on their plans for product rollouts, feature sets and product support to prepare for network management change

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SEMINAR AGENDA

See the Sponsor Showcase for important information on leading network management vendors.

TURN TO INSIDE BACK COVER

9:00 - 9:30 **Moderator's Address**

Hear Jim Herman's overview of the issues and pitfalls of implementing network systems and service management at an enterprise level. He will also identify and explore the most common network management problems that enterprises, and you, need solved.

9:30 - 10:30 **Managing Enterprise-Wide Network Systems and Network Services**

The vendor panel will present different views on what it means to manage at the level of systems and services, not components and boxes. This discussion will cover capabilities such as: network systems management, integrated network management, policy-based management, network performance management, capacity planning, and service management (including service level management and the management of service providers). A summary of business benefits and drivers, as well as the architectures employed to deliver these capabilities, will be presented.

10:30 - 11:00 **Break**
Product and Vendor Demonstrations I

11:00 - 12:15 **Implementation: Getting the Payoff from Enterprise Network Management**

The panelists will provide implementation and phasing advice on how you can create the capabilities discussed in the previous segment. Topics include: implementation strategies, developing the business case (including ROI and TCO analysis), using systems integrators, prioritizing efforts, and adapting support processes and organizational structure to exploit enterprise management capabilities. Additional project management advice will be offered by the moderator.

12:15 - 1:15 **Complimentary Lunch**
Product and Vendor Demonstrations II

Take this opportunity to network with your peers and establish relationships with vendors who can aid you in reaching your network management goals.

1:15 - 3:00 **Using the Web to Manage the Web**

The panelists will present innovative Web technologies that integrate management tools and databases to create an enterprise-wide network management infrastructure. This infrastructure is cost effective, adaptive and easy to implement. Areas of discussion include: new WBEM/CIM standards, new Web-based user interfaces to management tools, the management of intranet/extranet, the use of Web technologies for third-party ISV integration, and Web-based IT support collaboration.

3:00 - 4:00 **Learning from the Past: Overcoming the Challenges of Enterprise Network Management**

John Gallant will lead a hard-hitting discussion between the audience, vendor panel and moderator on how today's products and services address the problems of the past. This roundtable will explore new approaches to installation and updates, support strategies, packaging of functionality, strategies for integration of ISVs, and greater levels of automation.

4:00 **Closing Remarks and Raffle**

Throughout the day you'll have the opportunity to enter a raffle to win a portable color LCD TV. You must be present at time of drawing to win.

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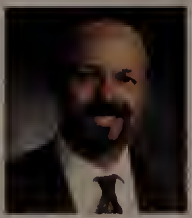
Learn from the Experts

The special format of this interactive program fosters an open dialogue among the audience participants, vendor panel and moderators and will offer insight and depth into this critical topic.

Jim Herman

Jim Herman is vice president of **Northeast Consulting Resources, Inc.**, a strategic management consulting group with significant experience in bringing about meaningful change in their worldwide clients' organizations and technology infrastructures. He is a widely known and well-respected expert on information technology and its management, having been involved with the development of solutions for multivendor networking since 1976. He pioneered ARPANET network management and switching software. Recent assignments have involved information systems strategy and architecture for leading multinational enterprises.



John Gallant

John Gallant is editor in chief of ***Network World***, one of the fastest growing publications in the computer/communications industry. With more than 15 years of experience covering the industry, Gallant sets the strategic direction for the newsweekly, which serves 164,000 network IS professionals. As senior vice president, Gallant also guides Network World Publishing, Inc.'s (NWPI) other editorial ventures including the Signature Series, a bimonthly series of special editorial issues. Gallant also helps determine the focus and content of NWPI's professional development seminars and conferences. These programs are some of the most advanced in the industry, with thousands of network professionals attending its seminars and other events each year.

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PRICE PRIZE AT&T CEO Armstrong says customers can reduce voice/data delivery bills by up to 20% with carrier's new merged service. Page 14.

BANKING ON BIG BACKBONES Neo Networks unleashes hefty Gigabit Ethernet switch. Page 6.

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NetworkWorld

February 1, 1999 Volume 16, Number 5

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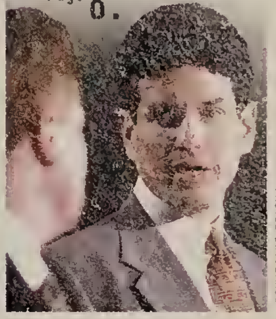
SHOWDOWN at frame corral

Page 8.



PHOTOS: STAN BAROUH

VALERIE SINCLAIR

UNREALIZED POTENTIAL

Storage-area networks hold great promise, but the lack of automation software is holding up deployments. Page 39.

Review: Microsoft Site Server 3.0 Commerce Edition stands out in our test of tools that help you build an Internet storefront. **Page 41.**

Review: Lighten your PC administration load with ON Technology's ON Command CCM 4.0. **Page 45.**

Intel's lean-client Scud turns out to be a dud

BY JOHN COX AND MARC SONGINI

Andy Grove has often said that only the paranoid survive. Well, Intel was probably a bit antsy in December of 1997 when it launched its so-called lean-client specification. Nervous that Java would cut into Windows, afraid that network computers would push aside PCs, and fretful that fewer folks would need its chips, Intel's unease was understandable.

The company's lean-client specification aimed to relieve that uneasiness and place the Intel x86 — particularly the older, less-expensive chips — squarely in the center of the thin-client universe.

That universe turned out to be smaller than experts expected, and so far, Intel's role in it has been minuscule.

In the year since Intel unveiled its plan, only one company, Network Computing Devices (NCD), has shipped an Intel lean-client device.

IBM says by June it will have a high-end network computer (NC) that uses an older Intel Pentium chip and relies on the APIs and management features called for by the Intel lean-

See **Intel**, page 57

COMNET/DC '99 COVERAGE

PHOTOS: STAN BAROUH

ComNet attendees prep for big network changes

BY *NETWORK WORLD* STAFF

WASHINGTON, D.C. — It was decision time last week in the nation's capital.

While U.S. lawmakers voted on that other matter, tens of thousands of IS professionals descended upon the nearby ComNet/DC '99 conference to gather the information they need to decide on the future of their networks.

Should they migrate all their traffic to an IP network, and, if so, how fast? Should they throw bandwidth at their problems, or buckle down and put sophisticated quality-of-service technologies in place? Are virtual private networks (VPN) the way to go?

The 450 vendors and the host of industry-expert speakers proved only too happy to offer answers to these questions.

Cisco's CEO John Chambers preached the gospel of IP to a standing-room-only crowd of

See **ComNet**, page 56

More Online

- A roundup of announcements, keynotes and debates at the show.

1341

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Supreme Court tells telcos to open nets

BY DAVID ROHDE

WASHINGTON, D.C. — The regional Bell operating companies have to do what the Federal Communications Commission tells them to do after all.

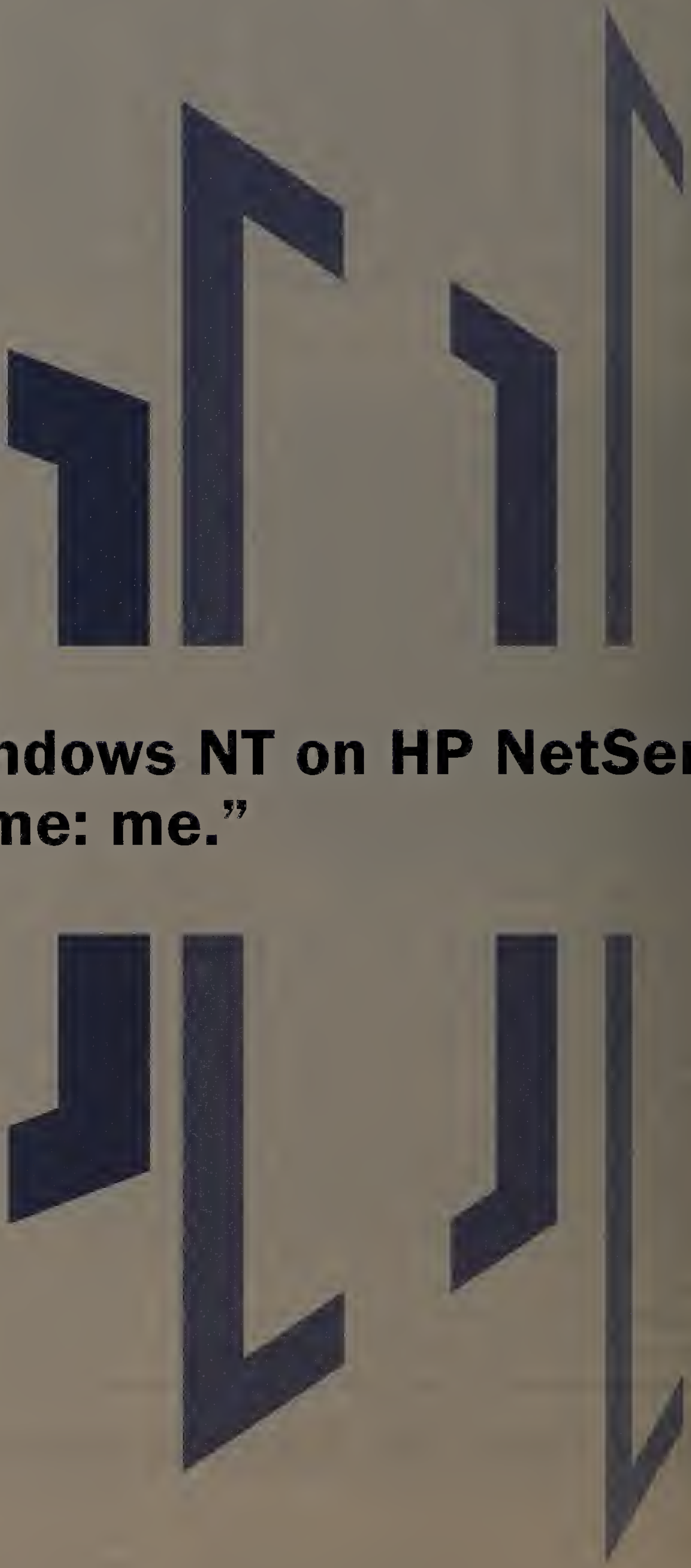
In a victory for long-distance carriers and new local carriers, the U.S. Supreme Court last week ended a three-year battle over telecom-reform rules by reinstating the FCC's basic blueprint for local competition.

The FCC's 1996 rules direct RBOCs and other incumbent local exchange carriers to provide local loops, switching ports and other network elements to competitors at specified prices. A St. Louis federal appeals court threw out those regulations in 1997, ruling that only the states could set prices

See **FCC**, page 57

Newspaper $5.00

"Since installing Windows NT on HP NetServers,
determines downtime: me."



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only one thing

“It was like a startup opportunity: two of our subsidiaries merged into one new location. Bottom line? On day one, 500 employees came in, logged on, and worked as usual. And in the year since installing Microsoft® Windows NT® Server 4.0 on HP NetServers we haven’t had any unplanned downtime. This is great news for the entire IT staff—all five of us.”

Ray Kump, Director of IT
Mitsubishi Electric Automation

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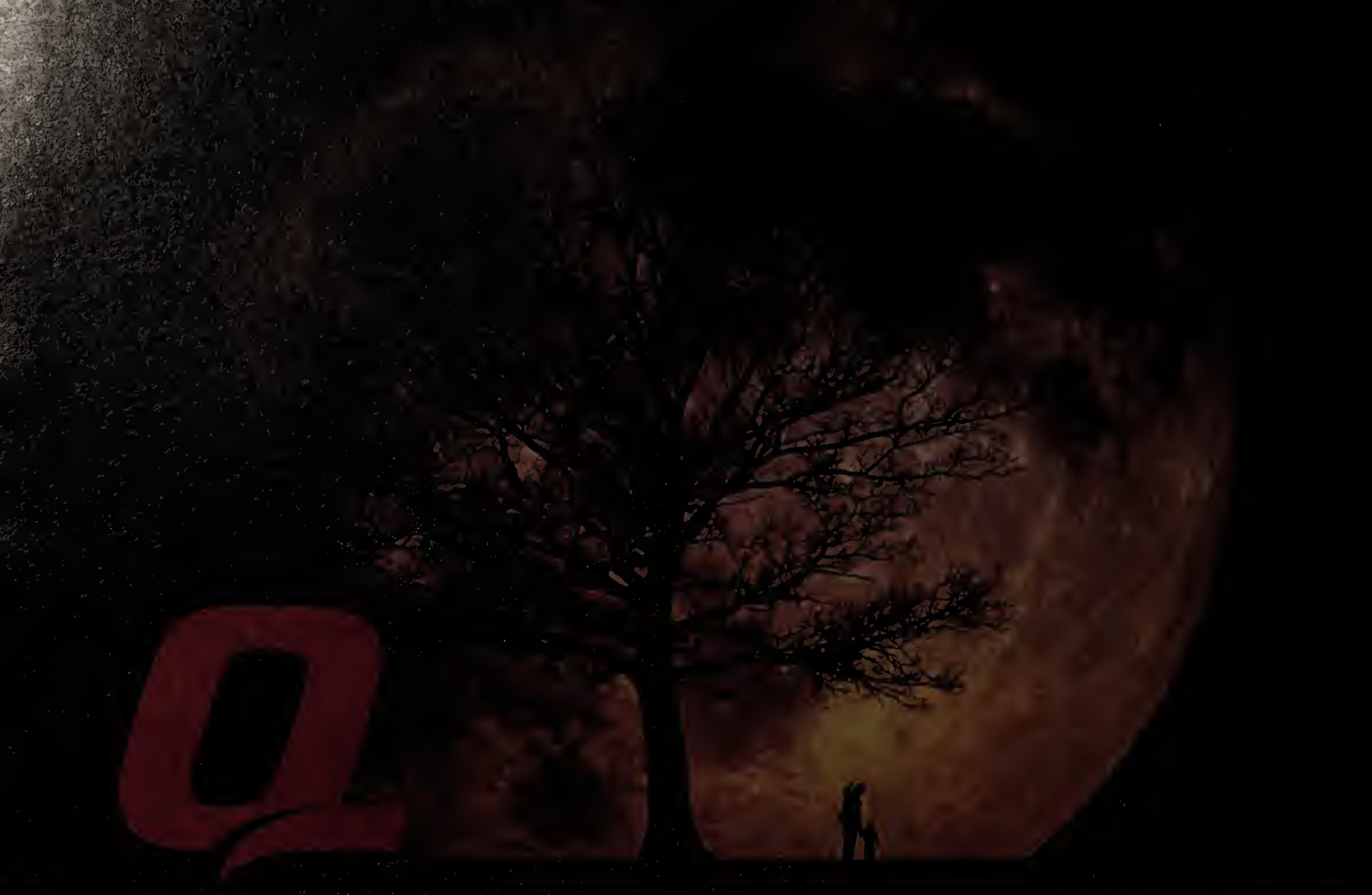

Why does the moon stay in the sky?
What makes the stars twinkle?
How does the Internet work?

Actually, it works extremely well. Maybe because so much of it runs on Compaq. Four out of the five most popular Web sites are powered by Compaq. Hundreds of millions of hits are handled by Compaq platforms every day. Three-quarters of the top ISPs have standardized on Compaq for their Windows NT® based Web hosting. And if you've ever received e-mail, chances are, we helped get it to you. To find out how the Internet can help grow your business, feel free to ask the source at 1-800-AT-COMPAQ. Or visit www.compaq.com/moon.

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[illegible]

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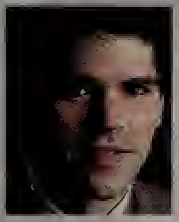
THIS WEEK ONLINE

Outta this world. How do you build a LAN in space? Read about the network NASA is installing in the new space station – and about Vint Cerf's plans for an interplanetary version of TCP/IP. **DocFinder: 1348**

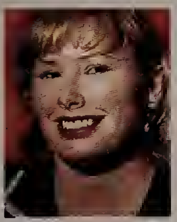


Keeping Current. Fred McClimans wonders why, in 1999, a carrier can't get its billing act together. Specifically, what's the deal with Bell Atlantic Mobile? It is still hounding him to pay for an account he cancelled months ago. **DocFinder: 1344**

Help! A help desk technician who's just finished NetWare 4.X training wants to know what sort of questions he should expect. Help him out at **DocFinder: 1345**

Network documentation. What tools do you use to document your network? **DocFinder: 1346**

Cable modems. Sure, they seem fast. But one reader says they have terrible latency, which can really mess up interactive applications, such as telnet sessions, not to mention Quake matches. If you use a cable modem, what has your experience been? **DocFinder: 1347**



Water Cooler: Features Managing Editor Amy Schurr reports on a survey about network operations centers: Users say management tools are getting better, but they're having a difficult time finding qualified staff to run them. **DocFinder: 1349**

DHCP. How could you configure a DHCP server so that users can log on from any remote site? One reader seeks your help. **DocFinder: 1330**

How to get onto Network World Fusion

Click on Register on the home page and follow the instructions. Subscribers, keep your NWF number — highlighted on the front cover's mailing label — handy during registration. Nonsubscribers must fill out an online registration form.

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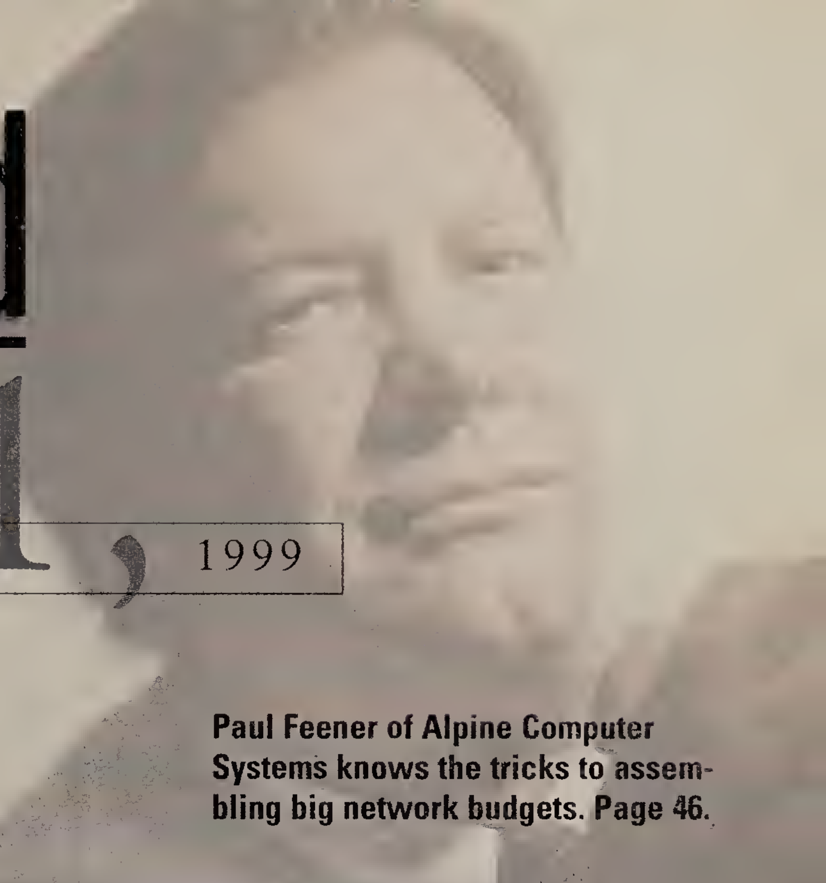
Table of Contents

FEBRUARY 1, 1999



Paul Feener of Alpine Computer Systems knows the tricks to assembling big network budgets. Page 46.

NEWS

6 Neo targets Gigabit Ethernet aggregation market.
8 Frame relay carriers go head to head at *NW* Showdown.
8 Sequent servers blend Unix and NT.
10 Digital subscriber line is hot at ComNet/DC '99.
10 Linus blesses official release, OKs Linux refresh.
12 Microsoft is upgrading its NT wares.
14 AT&T's merged service promises reduced voice/data bills.
15 Inverse boosts performance management software.

INFRASTRUCTURE

17 Storage-area network start-ups are gathering steam.
18 Softway readies 64-bit Unix applications for NT.
20 Newbridge VPN gear helps users prioritize.
20 Dave Kearns: Get rid of Windows, get your money back!

CARRIERS & ISPs

25 Level 3's Crowe: Competitors are in the wrong race.
28 Daniel Briere and Christine Heckart: Low-cost DSL, cable carry bottlenecks.

ENTERPRISE APPLICATIONS

29 Marimba solves Home Depot database download dilemma.
29 Lotus bangs the knowledge management drum.
32 Scott Bradner: Busy days on the cryptography front.

TECHNOLOGY UPDATE

33 Exposing the deep, dark secrets of TCP/IP.
34 Gearhead: Serious about security? Who the X.509 are you?

Special Focus

HANDHELD COMPUTING

IS leaps handheld hurdles, hops on hot technology. Page 22.

MANAGEMENT

46 Make the annual budgeting chore less burdensome.

OPINIONS

36 Editorial: Chips ahoy! How C-Port could shake things up.
37 Daniel Blum: Manageable PKI is coming soon.
37 Winn Schwartau: A fresh approach for fixing Year 2000.
58 Backspin: Jumping on the serialized bandwagon.
58 'Net Buzz: Of runways and RAM; movie viewing the multicast way.

Net Know-It-All .... Page 10
Ask Dr. Intranet .... Page 33
Message Queue .... Page 36
Editorial and advertiser indexes ...... Page 55

HOW TO CONTACT US

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FEATURES

Unrealized Potential

Storage-area networks hold great promise, but the lack of automation software is holding up deployment. Page 39.

REVIEW: Microsoft's Site Server 3.0 Commerce Edition stands out in our test of tools to help you build an Internet storefront. **Page 41.**

REVIEW: Lighten your PC administration load with ON Technology's ON Command Comprehensive Client Management 4.0. **Page 45.**

NEWS BRIEFS, FEBRUARY 1, 1999

Navigator on the move . . .

Don't be too quick to bury Netscape Navigator. New research data from Santa Monica, Calif., consulting company Positive Support Review (PSR) shows that usage market share for Microsoft's Internet Explorer peaked at 62.3% last June and has since fallen back to just over 57%. Despite Explorer's stumble, however, Navigator's 37.4% usage share remains a distant second. Victor Janulaitis, PSR's CEO, believes Microsoft has hit a wall in terms of spreading Explorer through the company's operating system and desktop dominance. The so-called browser war has reverted to a feature/function playing field, Janulaitis says, a place where he sees Navigator holding a clear edge, at least for now.

. . . but Andreesen's staying put

Wherever AOL takes Netscape once the ink dries on that $4.2 billion deal, Netscape co-founder Marc Andreesen will apparently be along for the ride. Andreesen, 27, has reportedly agreed to accept the previously nonexistent position of chief technology officer at AOL, according to published reports. While none of the principals were confirming the news last week, Andreesen will apparently answer directly to AOL CEO Steve Case and be responsible for steering big-picture technology decisions. Retaining Andreesen is seen by some to be key to AOL's efforts to stem the flow of technical talent out of Netscape.

Andreesen decides to stay.

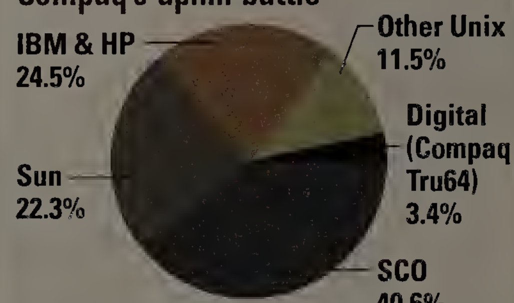
VPN options grow as MCI adopts Microsoft tunneling protocol

MCI WorldCom now has seven virtual private network (VPN) offerings just within its Advanced Networks unit. The latest is dubbed SafeReach NT VPN. This new offering incorporates Microsoft's Point-to-Point Tunneling Protocol into a client dialer script that MCI WorldCom automatically provides from 1,100 points of presence. The result: Dedicated software for the SafeReach service doesn't have to be loaded on all potential remote users' PCs. More open tunneling standards, including IP Security, are planned for the service in the future, when those standards are more "fully developed," company officials said.

Give me IP on the side and hold the VPN

Bob Smith, MCI WorldCom's Internet services executive senior manager for Internet products, may have IP religion, but he knows on what side the carriers' bread is buttered. Before an educational session on the future of private networks, Smith related with amazement stories of new corporate chief information officers coming in and demanding to swap out frame relay and other legacy WANs in favor of IP-based virtual private networks — even if they cost more. "If I were linking up 40 or 50 locations with no reason to expose that network [to sites outside the company], I would choose frame relay, ATM or private lines," Smith declared. Smith said he asked one CIO why he was so bent on a newfangled VPN. The response: "I had a consultant from a three-letter company tell me it was the thing to do."

Compaq's uphill battle



SOURCE: IDC, FRAMINGHAM, MASS.

Unix by another name is still Unix

In the bold and wishful thinking department this week we have Compaq, which last week said it wants to be to the Unix market leader. In that vein, as of today, Digital Unix will be known as Compaq Tru64 Unix. Digital Unix is one of the operating systems that Compaq inherited when it acquired Digital in June 1998. In addition to the rebranding, Compaq is launching a wide-ranging campaign to beef up sales of its high-end, 64-bit Alpha servers running Digital Unix. As part of the strategy, Compaq last week announced an entry-level Unix server that runs on the Alpha processor (see story, page 8).

Sticker shock for CEO's kin

Never mind Wall Street, AT&T CEO C. Michael Armstrong has had some explaining to do at home after engineering AT&T's recent rash of expensive acquisitions. Armstrong, a former top IBM honcho, told the crowd at ComNet/DC '99 that the day AT&T bought the IBM Global Network for $5 billion, his mother called his wife and said: "Isn't it wonderful that after all those years at IBM, he could buy it back? But don't you think $5 billion is a bit too much?" Armstrong didn't reveal his mom's reaction when he told her that he had gotten only a piece of Big Blue's business for AT&T's billions instead of the whole shebang.

Neo plots Gigabit Ethernet assault

BY JIM DUFFY

WASHINGTON, D.C. — Router start-up Neo Networks is banking that users will gather backbone bandwidth into Gigabit Ethernet bunches.

The company in April will launch an all-out assault on the Gigabit Ethernet market with a new eight-port module and other enhancements for its StreamProcessor 2400 backbone router, Neo officials said at the ComNet/DC '99 show last week. Neo will also disclose beta customers, and performance results from testing lab The Tolly Group.

Neo box promises big bandwidth bang, small price.

PHOTOS: STAN BAROUH

The moves are intended to drive home Neo's message that it can deliver higher performance enterprise net routing products at more competitive prices than the market leaders.

"We're going to be the gorilla on the block with the lowest price," says Mark Cree, vice president of marketing at the firm. That may be hard to do, given that Neo will charge $2,600 per port for its new Gigabit Ethernet module, and market leader Cisco just rolled out new switches at about $2,000 per Gigabit Ethernet port.

Neo has been keeping a low profile for the past few months while it shifted gears and refocused its development and marketing efforts. StreamProcessor was initially targeted at enterprise networks, but Neo also planned to position it as an ISP router for the Internet core.

But Neo put the ISP plans on hold months ago and postponed development of OC-12 and OC-48 interfaces for that market while waiting for demand in Gigabit Ethernet to build up.

Meanwhile, StreamProcessor, which was supposed to ship in the second quarter of 1998, never went out the door.

"We could have forced it, but there was no volume buildup," Cree says. "We took a gamble."

Perhaps it will pay off. Demand is rising for Layer 3 switches and routers that can aggregate scores of Gigabit Ethernet uplinks from 10/100M bit/sec switches in enterprise net wiring closets. Cisco rolled out the Catalyst 6000, squarely targeted at concentrating up to 130 Gigabit Ethernet uplinks from Catalyst 5000s in wiring closets (*NW*, Jan. 25, page 1).

"The announcement by Cisco certainly added some validity to [gear] like the Neo Networks box," says Esmeralda Silva, LAN analyst at International Data Corp. in Framingham, Mass. "Aggregation would certainly be a key application for these types of boxes."

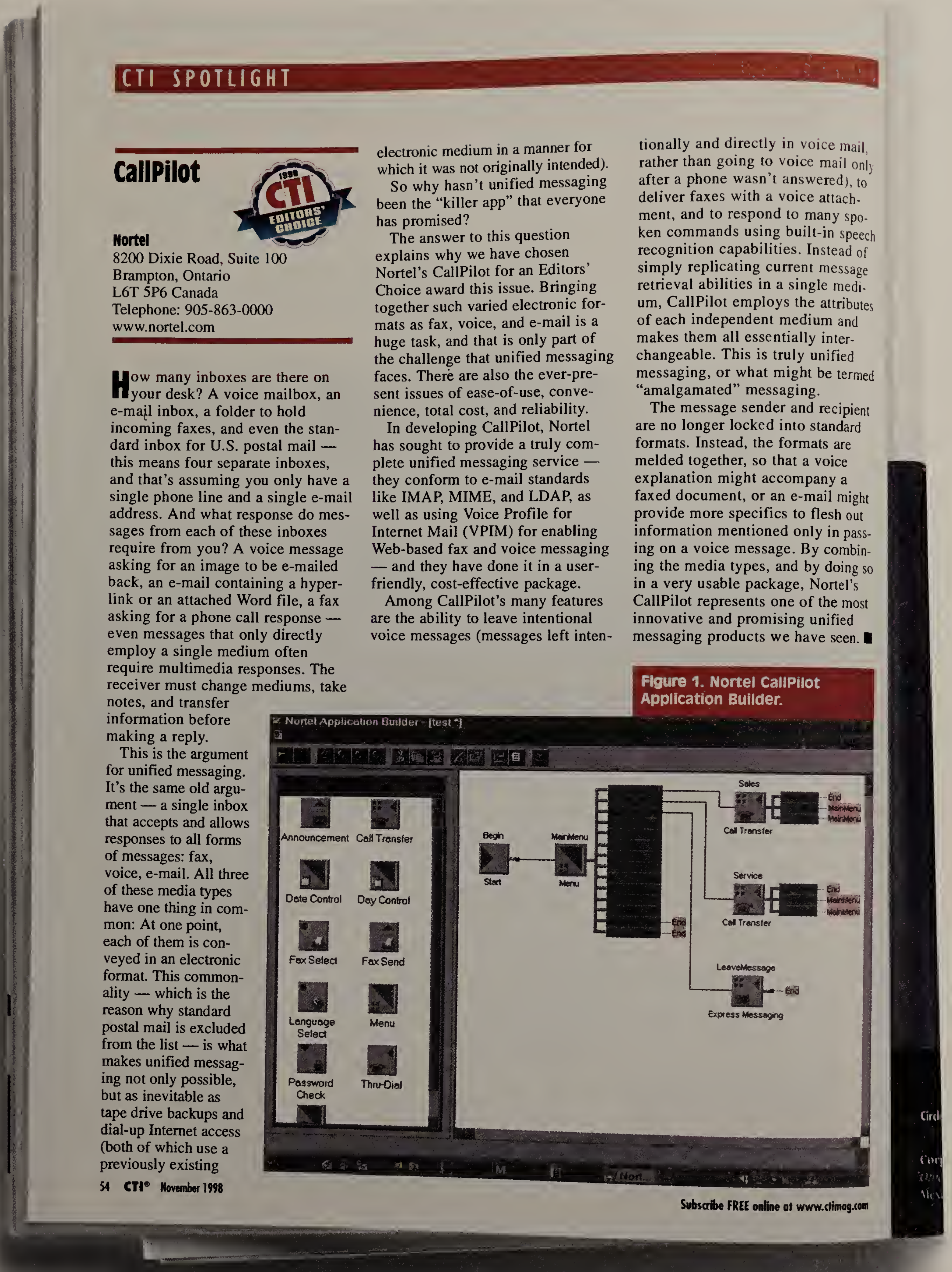
Neo's eight-port Gigabit Ethernet module will allow the 16-slot StreamProcessor 2400 to concentrate 128 Gigabit Ethernet links. It will ship in April.

Neo in April will also add full wire-speed RMON monitoring to each Gigabit Ethernet port. This will allow the StreamProcessor to make quality-of-service and policy decisions on packets based on Remote Monitoring statistics, something the Cisco Catalyst 6000 can't match, Cree says.

Before April, Neo will announce high-speed packet filtering for the StreamProcessor 2400, and link aggregation capabilities for resiliency and load balancing.

But in April, Neo will make its most important announcement: After a year delay, StreamProcessor 2400 is shipping, and there are some customers.

Neo: (612) 979-1200



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How many inboxes are there on your desk? A voice mailbox, an e-mail inbox, a folder to hold incoming faxes, and even the standard inbox for U.S. postal mail — this means four separate inboxes, and that's assuming you only have a single phone line and a single e-mail address. And what response do messages from each of these inboxes require from you? A voice message asking for an image to be e-mailed back, an e-mail containing a hyperlink or an attached Word file, a fax asking for a phone call response — even messages that only directly employ a single medium often require multimedia responses. The receiver must change mediums, take notes, and transfer information before making a reply.

This is the argument for unified messaging. It's the same old argument — a single inbox that accepts and allows responses to all forms of messages: fax, voice, e-mail. All three of these media types have one thing in common: At one point, each of them is conveyed in an electronic format. This commonality — which is the reason why standard postal mail is excluded from the list — is what makes unified messaging not only possible, but as inevitable as tape drive backups and dial-up Internet access (both of which use a previously existing electronic medium in a manner for which it was not originally intended).

So why hasn't unified messaging been the "killer app" that everyone has promised?

The answer to this question explains why we have chosen Nortel's CallPilot for an Editors' Choice award this issue. Bringing together such varied electronic formats as fax, voice, and e-mail is a huge task, and that is only part of the challenge that unified messaging faces. There are also the ever-present issues of ease-of-use, convenience, total cost, and reliability.

In developing CallPilot, Nortel has sought to provide a truly complete unified messaging service — they conform to e-mail standards like IMAP, MIME, and LDAP, as well as using Voice Profile for Internet Mail (VPIM) for enabling Web-based fax and voice messaging — and they have done it in a user-friendly, cost-effective package.

Among CallPilot's many features are the ability to leave intentional voice messages (messages left intentionally and directly in voice mail, rather than going to voice mail only after a phone wasn't answered), to deliver faxes with a voice attachment, and to respond to many spoken commands using built-in speech recognition capabilities. Instead of simply replicating current message retrieval abilities in a single medium, CallPilot employs the attributes of each independent medium and makes them all essentially interchangeable. This is truly unified messaging, or what might be termed "amalgamated" messaging.

The message sender and recipient are no longer locked into standard formats. Instead, the formats are melded together, so that a voice explanation might accompany a faxed document, or an e-mail might provide more specifics to flesh out information mentioned only in passing on a voice message. By combining the media types, and by doing so in a very usable package, Nortel's CallPilot represents one of the most innovative and promising unified messaging products we have seen. ■

Figure 1. Nortel CallPilot Application Builder.

We were going to run an ad touting our new CallPilot messaging system. But CTI magazine beat us to the punch.

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ComNet: Frame relay carriers lock horns

BY NETWORK WORLD STAFF

WASHINGTON, D.C. — If you had to design the ideal frame relay service, it would provide lots of ports in cities in which you have the most sites, national and international coverage, gobs of managed service options and a watertight service-level agreement (SLA). Oh, and it would be cheap, too.

One thing was clear after last week's Network World Frame Relay Showdown at ComNet/DC '99: Nobody offers all those options. But the seven frame relay vendors on the panel vied to demonstrate which of them comes closest, and they revealed some surprises along the way.

The event pitted the three frame relay market leaders — AT&T, MCI WorldCom and Sprint — not only against one another but vs. a handful of other carriers (see graphic).

Right off the bat, AT&T was questioned about its years-long reliance on Cisco's frame relay switches. But AT&T's Joe Lueckenhoff said the carrier actually has a "multivendor strategy," with different switches performing different functions. However, he conceded that users may still have all their ports on the same Cisco switches that apparently caused the 36-hour outage on AT&T's net last April.

Lueckenhoff also turned the question of switching platforms back on his key competitors. Noting that MCI WorldCom is in the process of upgrading from an old Bay Networks platform to new, higher capacity Ascend switches, he questioned whether users would be inconvenienced.

"We can put a permanent virtual circuit up overnight because we have a seamless network," Lueckenhoff said, challenging MCI WorldCom's John Scarborough.

That's when Scarborough decided to make some news. Yes, indeed, MCI WorldCom is upgrading its frame relay network to Ascend CBX 500 switches, he said. But he rejected the idea of calling it a "migration." Rather, Scarborough revealed that Ascend has developed software that creates what he called a "next-generation, network-to-network interface," or NNI, between the two platforms. The difference between this and a traditional NNI between two carrier networks is that the new NNI provides "end-to-end visibility between the two networks," he claimed.

Then AT&T got help from Qwest's Mack Greene, who brought up the issue of Sprint maintaining two platforms. National newcomer Qwest uses a single Ascend platform for its frame relay and ATM customers. Sprint's Brad Hokamp conceded that older Sprint customers are on an Alcatel frame

See **Carriers**, page 12

Bob DaGiau, Infonet · John Scarborough, MCI WorldCom · Brad Hokamp, Sprint · Tom Wilson, US WEST · Michael Johnson, Intermedia · Joe Lueckenhoff, AT&T

The faces behind the Showdown

The Network World Frame Relay Showdown – the seventh in an ongoing series of debates sponsored by *Network World* – featured representatives from seven carriers and a panel of three experts.

The three experts were *Network World* Senior Editor David Rohde, Tolly Group Senior Vice President Atul Kapoor, and Steve Bell, president of the Silicon Valley Networking Lab.

The debate was moderated by John Gallant, *Network World* editor in chief.

Mack Greene, Qwest

Sequent servers blend Unix and NT

BY DENI CONNOR

SAN DIEGO — Can't decide between Unix and Windows NT? Sequent says you can run them at the same time if you buy the company's new NUMA-Q 1000 server.

According to Sequent, NT's integration with Unix, along with the power of Sequent's clustering and multiprocessing, gives NT a solid boost in corporate data centers.

One customer agrees. "We are looking to move Windows NT into the glass house and yet allow departments to do their own thing. The NUMA-Q 1000 lets us do that," says Buddy Harrell, director of computer systems for office equipment manufacturer Lanier in Atlanta. Harrell manages a 4,000-user network that includes Unix and NT.

Available in March, the NUMA-Q 1000, which runs Windows NT and Unix concurrently, is designed for data marts and large-scale data center environments.

Sequent expects that customers will use Windows NT as the application server that could feed data into more compute-intensive Unix programs.

With the NUMA-Q 1000, you can have your Unix, and NT too.

Less expensive

The NUMA-Q 1000 is a less expensive version of Sequent's NUMA-Q 2000, a Unix-only server. The less-expensive server supports fewer processors, comes in a smaller cabinet and has a smaller power supply.

The NUMA-Q 1000 is a 400-MHz, four- to eight-processor Pentium II Xeon-based system with up to 1M byte of Layer 2 cache and 8G bytes of main memory.

Clustering is handled by Sequent's proprietary interconnect technology. The company's NUMA family scales up to 64 processors and uses Non-Uniform Memory Access (NUMA) and a secondary cache to increase performance and file access in large commercial environments.

The new server comes with an Adaptec four-port 10/100M bit/sec Ethernet adapter, 32- and 64-bit PCI slots, redundant components and 18G bytes of 10,000-rpm storage, as well as Fibre Channel connections to external storage.

The NUMA-Q 1000 starts at $93,583.

Sequent: (800) 257-9044

Compaq adds AlphaServer

BY DENI CONNOR

Compaq last week launched a new 64-bit, dual-processor AlphaServer that runs Unix, Windows NT, OpenVMS or the up-and-coming open source star, Linux.

The latest addition to the line Compaq inherited from Digital, the AlphaServer DS20 EV, is equipped for compute-intensive duties, such as business intelligence and Web hosting. The machine comes with one or two 500-MHz Alpha processors and has a memory range of 128M to 4G bytes. Storage capacity is 128G bytes.

Other specifications include:

- Seven hot-swappable disk drives
- Error checking and correcting memory
- Redundant power supplies
- Remote management console
- Six 64-bit PCI slots
- 10/100M bit/sec Ethernet controller

In addition, the DS20 employs crossbar technology for simultaneous access to all CPUs and low latency, which eliminates bottlenecks. It has I/O throughput of 532M byte/sec.

The AlphaServer DS20 EV can handle compute-intensive tasks.

The DS20 using Tru64 Unix or OpenVMS starts at $19,900. A Linux-ready version starts at under $15,000. The box comes with Netscape Navigator, an Apache Web server, firewall and the Java Development Kit.

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DSL services hot at ComNet

MCI WorldCom, Sprint announce big digital subscriber line deployments.

BY TIM GREENE

WASHINGTON, D.C. — If you were at ComNet/D.C. '99 last week, chances are you walked away feeling pretty good about digital subscriber line (DSL) services.

First of all, in a breakthrough deal, MCI WorldCom committed to resell 100,000 DSL lines that it will buy from DSL service provider Rhythms NetConnections — more than double the number of DSL lines in service in the U.S. today.

Rhythms, a competitive local exchange carrier (CLEC), will lease local phone lines from regional Bell operating companies, provision them with DSL and then turn them over to MCI WorldCom. MCI WorldCom says it will also install its own DSL gear in local carriers' switching offices.

MCI WorldCom this spring will use DSL to link customers to its Internet, frame relay and ATM services. Later this year, the firm will include voice. Other DSL services the firm will develop include PBX extension, network performance monitoring and support for video.

ComNet NEWS

The company says it will package DSL lines as part of its On Net service package.

While other DSL CLECs have wholesaling deals with major long-distance carriers and ISPs, none of the traditional carriers has publicly committed to buying large numbers of lines.

The Rhythms-MCI WorldCom arrangement is the kind of alliance that will make DSL take hold, says John Stormer, vice president of marketing for NorthPoint Communications, a DSL CLEC that competes with Rhythms to wholesale DSL to other service providers.

"Regional ISPs buy lines, but they are not going to be the ones to drive DSL lines like AT&T, WorldCom, and newcomers like IXC and Level 3," Stormer says.

Only select metropolitan areas currently have DSL services because carriers are only beginning to roll them out. That can leave some customers looking for alternatives.

For example, Matt Larson, a DNS consultant for Acme Byte & Wire in Bethesda, Md., says Bell Atlantic listed his phone line as unqualified to handle DSL. But he got the service from CAIS, an ISP reselling DSL service provisioned by DSL wholesaler Covad Communications. Covad's provisioning includes running a new line that can carry DSL regardless of whether the existing phone line is good enough to support the service.

Other DSL developments coming from ComNet include:

- The easiest-to-install version of DSL, G.Lite, is making gains. G.Lite is a version of DSL that offers data transmission rates of 1.5M bit/sec. G.Lite requires no technicians to install gear at the customer site. The International Telecommunication Union last week reviewed the pending G.Lite standard and says it is on track for final approval in June. The ITU has also started working on standards for symmetric DSL and very-high-bit-rate DSL, which can run at 52M bit/sec over very short lines.
- Sprint announced it would team with Cisco to deploy DSL services starting later this year.

> **"Regional ISPs buy lines, but they are not going to be the ones to drive DSL lines like AT&T, WorldCom and newcomers like IXC and Level 3."**
>
> John Stormer, vice president of marketing, NorthPoint Communications

Network World Senior Editor David Rohde contributed to this story.

Linus okays Linux refresh

BY ROBIN SCHREIER HOHMAN

Linux leader Linus Torvalds said yes, so for the first time in about two years a new Linux kernel has been released.

Only Torvalds — the man who wrote the original kernel — can bless an official release. As one Linux developer put it, the kernel is ready, "when Linus says it's ready."

The new Linux, Version 2.2, contains no big surprises but offers a load of bug fixes and enhancements, as well as faster file access and support for new devices and protocols.

For the enterprise, one of the most significant new features is enhanced support for symmetric multiprocessing. In previous versions of Linux, only one processor can be handled by the kernel at a time.

With Linux 2.2, the kernel has been broken down into smaller pieces so that, for example, one area can handle networking while another is accessing file systems.

This makes each additional processor more effective than it was in earlier versions.

The new operating system also supports the Internet protocol IPv6 as well as SPX, which runs on top of Novell's IPX. Support for the protocols will likely increase Linux's already growing presence on Web and mail servers.

The new version also supports DecNet, the proprietary Ethernet LAN of Digital, now a subsidiary of Compaq.

Linux 2.2 has been ported to Motorola's 68000 line and PowerPC processors, which means it will run on all Macintosh computers.

However, more work has to be done on drivers before some Macintoshes will run Linux well.

Last week's release of Linux 2.2 is considered to be a stable release — in other words, not buggy. There have been numerous incremental releases since Version 2.0. In the Linux world, releases designated with an even number are considered to have most of the bugs worked out. Incremental, or developmental, releases have odd numbers, such as 2.1.

Both Caldera Systems, another Linux vendor, and Red Hat Software say they'll incorporate Version 2.2 into their products after they've tested it and found it to be stable. Neither vendor could predict when that would be. ◪

New network features in Linux 2.2

- Multiple-processor computers should run more efficiently.
- Ability to read the partition table formats used by other operating systems, including FreeBSD and Solaris.
- Support for Windows NT's NTFS drives and Windows 98's FAT32 drives.
- Interoperability with more Intel-based PCs.
- Better support for SPARC, SPARC64 and Alpha machines.
- Support for more Ethernet devices.
- Support for IPv6 and SPX.
- Still absent: USB ports and Windows plug-and-play support.

Be a
Net Know-It-All
For the answer to this week's question and more net trivia, visit Network World Fusion and enter 2349 in the DocFinder box.
This week's question:
What is RosettaNet?

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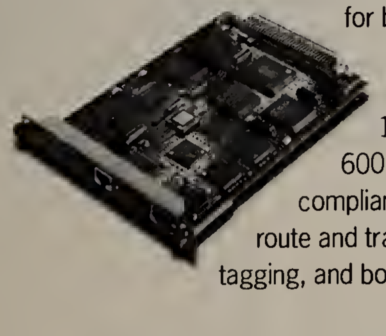

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THE MICROSOFT DIARIES

THE MICROSOFT-DOJ TRIAL: WEEK THIRTEEN

MONDAY, JAN. 25

The highest ranking Microsoft official set to testify in person — Paul Maritz — went live in court today, and Department of Justice Attorney David Boies was loaded for bear.

The two spent most of the day sparring over whether Maritz remembered threats he allegedly made to rival Netscape. Boies pointed to the testimony of two Intel officials who claimed that during a 1995 meeting Maritz talked about cutting off Netscape's "air supply" by offering Internet Explorer for free. Maritz denied making that threat.

TUESDAY, JAN. 26

Yes, Microsoft viewed Netscape's browser as a threat to Windows. That flash just in from Microsoft star witness Maritz. But that doesn't prove that Microsoft tried to collude with Netscape to split the browser market, he argued. Maritz today tried to explain away previously heard testimony by Netscape CEO James Barksdale, who said that Microsoft underlings in a June 1995 meeting made that very same market-splitting proposal. "Different people came out of that meeting with different impressions of what Netscape really wanted to do," Maritz said.

Did Maritz threaten to suffocate Netscape?

WEDNESDAY, JAN. 27

Windows magnate Maritz admitted today that Microsoft did press chip-giant Intel to pull an Internet multimedia software product off the market in 1995 and to later back away from embracing cross-platform Java. Both admissions play into the government's claim that Microsoft bullies its partners to advance the Windows cause.

But behind-the-scenes proceedings could also weigh heavily against Microsoft. In the pretrial deposition of Microsoft's next witness — Jim Allchin, personal and business systems vice president — Allchin says that even though the government dug up a computer science professor who wrote a program that could remove Internet Explorer from Windows 98, several operating system features were then rendered useless.

But also included in Allchin's testimony was a passing reference to a spreadsheet listing all the files comprising Internet Explorer. The government wants that list because it may show whether Microsoft illegally tied together the browser and the operating system.

The Justice Department lawyers filed a motion demanding access to this spreadsheet.

THURSDAY, JAN. 28

Hand it over, said the judge.

The spreadsheet may help the government on two fronts, Boies said. First, Boies said Microsoft executives have consistently said they "don't know" when asked how much of the browser code is shared by the operating system. The spreadsheet indicates that a "very simple test" could provide the answer, he said. Secondly, the spreadsheet data may underscore the government's claim that Microsoft "had no plausible reason to weld the entire Internet Explorer into the operating system," Boies said.

— Christine Burns

Microsoft upgrading NT wares

System management and SNA servers to pick up control, IP features.

BY CHRISTINE BURNS

What has three letters, starts with "S," is part of Microsoft BackOffice, and is due for a tuneup? If you guessed SMS, as in Systems Management Server, you would be correct. Then again, SNA, as in SNA Server, would also be right.

The new release of SMS, which hasn't been upgraded in two years, will ship next week. Dubbed SMS 2.0, the package will give administrators better control over software distribution tasks, and includes new tools for pinpointing network problems.

Microsoft is also prepping a service pack release for SNA Server that will provide better ties between NT and mainframe applications over standard TCP/IP links.

In the next couple of weeks, Microsoft will roll out Service Pack 2 for SNA Server 4.0. Microsoft Product Manager Kevin Keane says this release will help move SNA Server away from being a simple gateway and position it toward being an application integration platform.

When Microsoft released SNA Server 4.0 last spring, the software for the first time provided links between transactions running on NT Server and those running on IBM mainframe systems. The software could also link Microsoft SQL Server databases to IBM DB/2 systems. Both of these services were provided over SNA nets only. Service Pack 2 allows those services to run over TCP/IP links, as well.

What's on tap for SMS 2.0

The new version will ship next week with:

- Task-based administrative interface
- Integrated setup with SQL Server
- More consistent status reports
- Discovery-based software distribution
- Y2K compliance checking
- Network topology tracing tool
- Enhanced software metering

The pack also includes a message queuing bridge that lets applications send messages between Microsoft's Message Queue Server and the IBM MQSeries platform over TCP/IP. This bridge — which was available over SNA last year — translates messages between the two systems, ensuring that transactions between the mainframe and NT server are not lost.

SMS 2.0 will be able to target individual users, groups of users or entire network segments when rolling out operating system patches and desktop application upgrades, saving time and money, says Jon Lonoff, vice president of information systems at Banker's Trust in New York: "It lets me push the code out to whole IP segments instead of just one machine at a time. With 15,000 desktops on the network, that translates into a significant time savings."

Unfortunately, SMS 2.0 is a hog, says Andy Drooker, director of technology and infrastructure at Turner Broadcasting Sales in Atlanta. "I have it running on a server with a 300-MHz processor and 512M bytes of memory, and I am still maxing out memory and CPU."

Microsoft must rein in those system requirements, or smaller shops may not be able to afford to support SMS 2.0, he says.

Pricing for SMS 2.0 was not available.

Microsoft: (888) 673-8925

Carriers,

continued from page 8

relay platform, while newer customers are on Nortel Networks frame/ATM switches. But he added that the newer network provides LAN and SNA classes of service — a feature not provided by the other two leaders.

MCI WorldCom's Scarborough also tweaked Sprint's Hokamp over Sprint's comparative lack of local facilities. He noted that Sprint's recently touted 100% network availability guarantee for frame relay only applies where customers happen to be connected to one of Sprint's Broadband Metropolitan Area Networks.

By contrast, Scarborough claimed MCI can run frame relay and other services end-to-end across 81 markets via its On-Net service.

But the question of what creates a "seamless" end-to-end connection got a good workout, with much of the argument centering around NNIs.

The carrier that most relies on NNIs is Intermedia, which typically connects with RBOC's local frame networks. Long-distance carriers often can't handle lots of sites in one local calling area without backhauling the traffic to a faraway switch, said Intermedia's Michael Johnson.

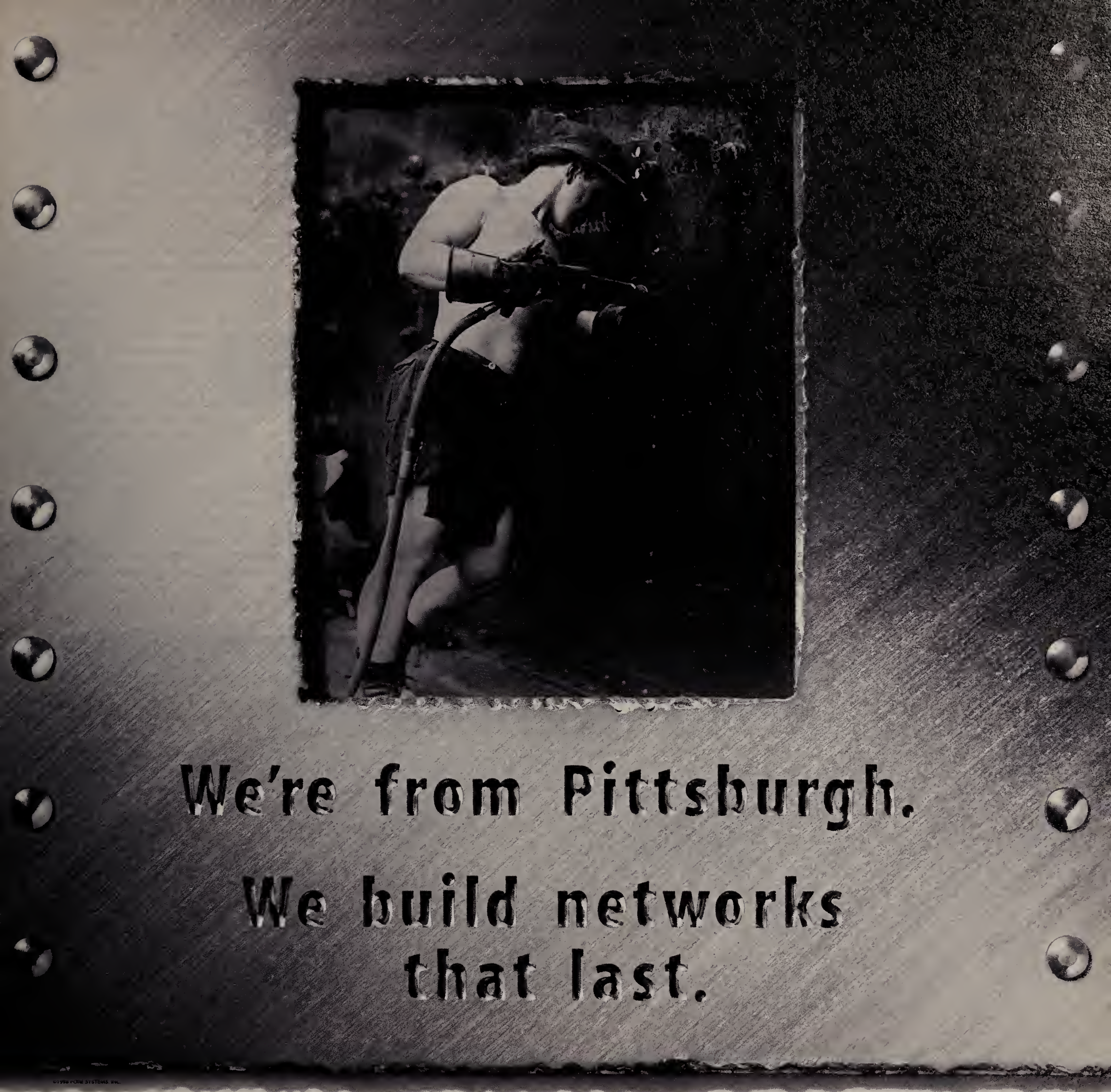
That caught AT&T in an apparent contradiction. AT&T has avoided NNIs with other domestic carriers, claiming they create inconsistencies in user features. Yet AT&T admits it's using NNIs internationally to connect some of its overseas markets.

The problem with proprietary NNIs is that they make it difficult to provide users with Web-based management tools for dissimilar platforms, Lueckenhoff explained. And they make it hard to manage and reconfigure PVCs. ◪

Corrections

A recent story (*NW*, Jan. 18, page 12) incorrectly stated that Dell's PowerEdge 1300 cost $1,699 and included Microsoft Small Business Server. Small Business Server is sold separately.

In the story "Entrust fights RSA with free PKI tool kit" (*NW*, Jan. 25, page 17), a photograph was incorrectly identified as John Ryan, CEO of Entrust Technologies. The photograph published was of Dennis Ryan, president and CEO of Allegis Corp.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AT&T's merged service promises reduced voice/data bills

BY DAVID ROHDE

ComNet NEWS

WASHINGTON, D.C. — AT&T unveiled its entry in the merged-services sweepstakes last week and promised delivery in the second half of the year.

At ComNet/DC '99, AT&T introduced Integrated Network Connection (INC), a service that combines voice and data traffic on a single dedicated-access line via an AT&T-installed access multiplexer (*NW*, Jan. 25, page 1).

INC initially will support only a T-1 access line, generally from a corporate branch office. Using voice compression, it will handle as many as 40 simultaneous voice calls with up to 512K bit/sec of data traffic — effectively creating 48 channels — instead of the 24 channels ordinarily obtainable on a T-1 access line.

In addition, network administrators will be able to continually vary the number of channels assigned to voice or data, using a process called dynamic bandwidth allocation.

INC resembles Sprint's Integrated On-Demand Network (ION), which also involves an on-premise ATM-based multiservice access device. INC is also related to MCI WorldCom's broader On-Net strategy, which bundles traffic on the carrier's increasingly extensive end-to-end facilities.

As with its rivals' past announcements, AT&T left out key details, such as the exact price of the service. AT&T CEO C. Michael Armstrong did say that users could end up saving 10% to 20% on their total bill by using INC. Analysts figure that to mean the price of INC and similar services won't be much below the carriers' prices for traditional, separate services. Instead, the cost advantage will be in the dynamic bandwidth allocation.

STAN BAROUH

Armstrong: Users could save 10% to 20% with INC.

"The price of a T-1 will be relatively the same," says Frank Dzubeck, president of Communications Network Architects, a Washington, D.C. consulting firm. "But you won't need the same number of T-1s."

AT&T also unveiled a service called IP-enabled frame relay, which provides a single permanent virtual circuit (PVC) from a user's frame net into a private or public IP network. That gives all the network's end users universal access without meshing PVCs among all the sites.

The INC service can take in frame relay, ATM, private lines and voice over the same access line, including IP traffic. When combined with the IP-enabled frame relay service, it can provide one link to the public Internet and another one to private or virtual private IP networks.

AT&T's long-term strategy is to link service-level agreements (SLA) to these kinds of managed, facilities-based services over a single access link, says Peter Bernstein, president of Infonautics Consulting, a telecom consultancy in Ramsey, N.J.

"They're [AT&T] going to say you don't get the benefit of the [best] SLAs unless you install this box," Bernstein says. "It's called locking in the customer." ◪

Inverse boosts performance management software

BY JEFF CARUSO

SUNNYVALE, CALIF. — New software from start-up Inverse Network Technology, Inc. will help enterprise network managers better measure service levels across WANs.

Expected later this month, the IP InSight software suite employs agents in remote PCs to collect response time data from users connecting to an ISP or corporate backbone. Agent data is forwarded to the ISP or to an enterprise net help desk to track down any problems.

The IP InSight agent software runs on all flavors of Microsoft Windows. Agents send data to central IP InSight collection software running on a Windows NT Server 4.0. Inverse estimates that each collector can service up to 400,000 clients.

The software, shown at ComNet/DC '99, is also intended to help users enforce service-level agreements for virtual private networks (VPN).

Service providers can also use IP InSight as a customer service.

"The feedback we got from our customers was that performance is more important than security" for VPNs, says Robert McKinney, director of business development for VPN services at GTE Internetworking, which will be starting a new service using Inverse's technology in coming months.

A recent TeleChoice survey sponsored by *Network World* also found that VPN performance ranks highest on users' lists of concerns, with 77% of respondents calling performance "very important" in VPNs. Security ranked second, at 72% (*NW,* Jan. 25, page 1).

IP InSight addresses three areas: operations, service-level management and customer support.

The operations application measures the network performance for dial-in users and generates alerts if response time or other measures violate preset thresholds. Inverse is planning to release a follow-up application in March that looks at dedicated connections, such as leased lines.

To address service-level management, one of the applications in the suite generates performance reports on service levels.

To aid in customer support, a separate application displays data about users' dial-in calls, showing what point of presence was called, whether the connection went through, the time of the call and other information. The application is intended to help customer support organizations track down recurrent problems.

STAN BAROUH

ComNet/DC '99 attendees gather at Inverse Network Technology's booth.

ISP MindSpring Enterprises hopes to make this customer support information available to its enterprise network customers, says Jim Markle, executive vice president of network services at the company.

Markle believes that providing the IP InSight information will cut down on the number of calls to MindSpring's service center. Pricing for IP InSight is based on the number of clients. A typical 1,000-client system would cost about $20,000.

Inverse: (408) 616-6200

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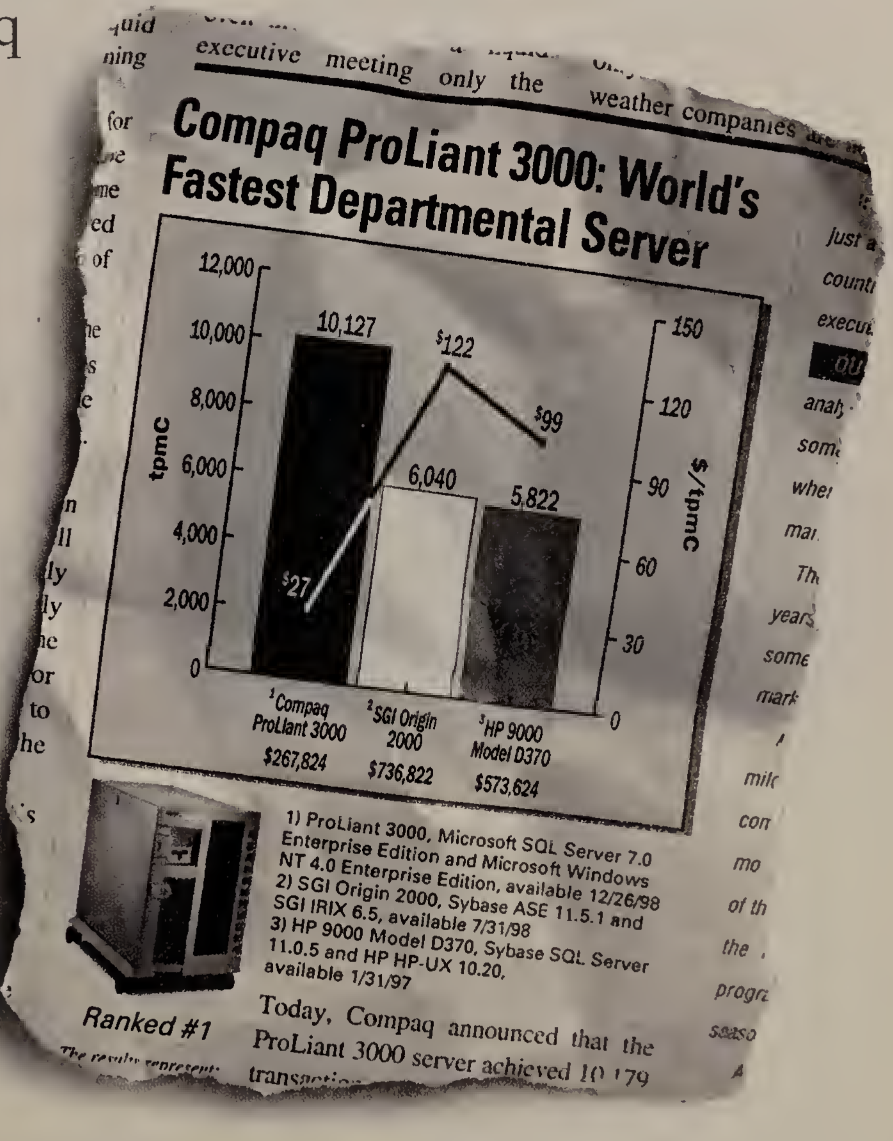

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2) SGI Origin 2000, Sybase ASE 11.5.1 and SGI IRIX 6.5, available 7/31/98
3) HP 9000 Model D370, Sybase SQL Server 11.0.5 and HP HP-UX 10.20, available 1/31/97

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[1] Dell'Oro Group, November 1998.

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Infrastructure

TCP/IP, LAN/WAN Switches, Routers, Hubs, Access Devices, Clients, Servers, Operating Systems, VPNs

Briefs

Tangent Computer last week unveiled a four-processor Pentium II Xeon server for graphics-intensive applications, such as Internet commerce, data warehousing and business processing.

Tangent's ProServ 3000 packs the power of four Pentium II Xeon processors.

The ProServ 3000 uses the Intel 450NX chipset to speed performance. It has a 400- or 450-MHz processor, 512K bytes of Level 2 cache and 4G bytes of RAM. The ProServ features a six-drive hot-swappable disk array, three 9G-byte 10,000-rpm disk drives and an Intel 10/100 EtherExpress network adapter.

A ProServ with 512K bytes of Level 2 cache and 256M bytes of RAM costs $12,995.

Tangent: (888) 826-4368

Nokia last week announced the IP650 integrated router and firewall. With redundant components, the IP650 is built for enterprises and ISPs. Interfaces include Ethernet, Fast Ethernet, T-1 with DSU/CSU, and the High Speed Serial Interface. Checkpoint Software's Firewall-1 is integrated in the product.

The IP650 will ship in March and will cost $16,995.

Nokia: (408) 990-2000

LAN equipment maker **Plaintree Systems** recently announced it is reducing its staff by one third, a restructuring that will affect 50 employees.

The Ottawa company has been losing money regularly over the past couple of years. For the quarter ended Sept. 30, 1998, Plaintree lost $4.7 million with only $3.5 million in revenue.

Storage start-ups gathering steam

A slew of venture-backed companies target storage-area network market.

BY DENI CONNOR

A gang of new companies is readying hardware, software and services that will make it easier for customers to manage and access storage resources across corporate networks.

With names like 3ware, Crag Technologies and DataCore, the firms will roll out products ranging from Windows NT-based SANs-in-a-can to storage management tools and Fibre Channel devices.

The companies are readying products meant to fill the gaps left by first-generation storage-area network (SAN) and network storage vendors, including Brocade Communications, Crossroads Systems and Gadzoox.

SANs remove storage resources from the confines of individual servers and support the resources on high-speed Fibre Channel networks free of other LAN traffic. Network-attached storage is a different approach that involves directly connecting storage resources to LANs rather than servers.

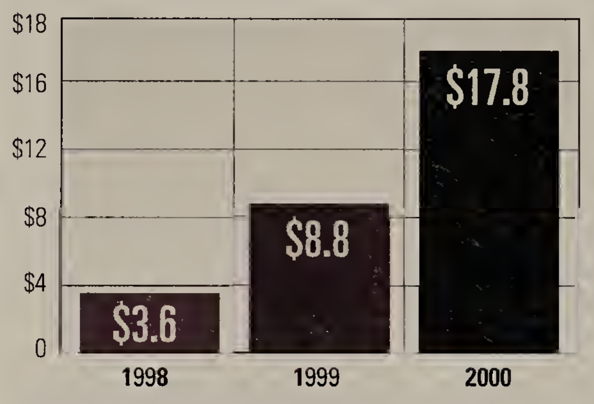
Mark Ferelli, an analyst at market research firm Strategic Research in Santa Barbara, Calif., says the evolution of storage from the server bus to the network is opening opportunities for many new companies and products. By 2000, the SAN arena is expected to be five times bigger than last year's $3.5 billion market, Strategic Research says.

Given the outlook for network storage, venture capital firms such as Dynafund Ventures in Los Angeles are on the lookout for new companies with interesting twists on the technology. Dynafund General Partner Denny Ko, an investor in SAN switch maker Gadzoox and newcomer Troika Networks, says he has $50 million in hand for new storage ventures.

Hot SANs

Analysts project almost a fivefold increase in worldwide SAN revenue over the next two years.

Total worldwide SAN revenue (in billions)



SOURCE: STRATEGIC RESEARCH, SANTA BARBARA, CALIF

Here come the start-ups

Among the new companies is DataCore Software Corp., which is developing Windows NT software that will run on a server that sits between a company's file servers and storage resources, such as physical disks, RAID subsystems and conventional controllers.

DataCore's storage domain server will manage file server access to storage systems as well as provide authentication services. In addition, the software will cache frequently used data so it will be readily available to network users.

The product will be designed to work with any vendor's storage technology and will be positioned by DataCore as a low-cost alternative to high-end storage management systems from the likes of EMC.

Initially, DataCore will deliver an OEM version of the company's software, code-named Sonata. Next year, a version code-named Symphony will be shipped to systems integrators.

Newcomer Crag Technologies is readying NT-based SANs-in-a-can consisting of storage, server, adapter card and management software components. The company, led by former Ridge Technology executives who are experienced in RAID development and storage management, will focus on making SANs easy to set up for small and mid-size businesses.

Crag's first product will be the CT 3000, an external RAID subsystem in a large-density enclosure. The company will also deliver Java-based software, called Perspective, for managing storage systems from Crag and others.

SAN Solutions in Incline Village, Nev., will also tackle SAN management.

The company, founded by former MountainGate executive Henry Aine, will offer a software package, code-named

See **Start-ups**, page 18

Solaris chief: Linux great for Sun

BY CHRIS NERNEY

MOUNTAIN VIEW, CALIF. — If a sitcom was made based on the hottest software around, it might be called *Everybody Loves Linux.*

Everybody except Microsoft, that is. One of the unmistakable selling points of the Unix-based open source code operating system software is its potential to be used as a weapon by Microsoft's competitors in their war against all versions of Windows.

And no other Unix vendor is embracing Linux as an NT alternative more warmly than Sun. Just listen to John McFarlane, Solaris software division president: "The movement back toward open systems is superb for Sun. It's a revitalization of open systems, a revitalization of Unix. People have come to the conclusion that NT just may not make it.

"There's a whole grass-roots revolution around getting back to open systems," he continues. "So we're big supporters of Linux."

Sun has demonstrated its support for Linux by:

- Porting Java 2, its latest version of the Java Development Kit, to Linux. This will enable developers to use Java to build applications that run on Linux.
- Porting Linux to its UltraSPARC workstations.
- Announcing plans to ensure that Linux works well with Solaris in mixed network environments.

McFarlane says that when it comes to third-party application development, what's good for Linux could also be good for Solaris. "If the developers are developing on Linux, it's a small step to Solaris and a relatively big step to NT," he says.

Linux was created eight years ago by Linus Torvalds, then a computer science

See **Linux**, page 18

Softway readies 64-bit Unix applications for NT

New edition of Interix software will let companies shift Unix applications to Wintel boxes.

BY CHRISTINE BURNS

SAN FRANCISCO — It's still anybody's guess as to when Microsoft will release a 64-bit version of Windows NT. So in the meantime, Softway Systems is working on a new version of its Interix software that will let customers run 64-bit Unix applications unmodified on Win64 systems when they do finally hit the streets.

The current edition of Interix — formerly called OpenNT — runs as a Windows subsystem just above the NT kernel. It enables companies to run their 32-bit Unix applications on inexpensive Intel processor-based desktop and server machines running Windows NT.

Interix differs from most emulation software in that it taps directly into the NT kernel. This integration allows Unix applications to run on Wintel machines at speeds comparable to those achieved when they run on higher end Unix boxes.

Interix-64 will sit on a future version of NT that will run on servers powered by Intel's yet-to-be released 64-bit Merced processors, dubbed Intel Architecture-64 (IA-64). This future combination will support applications now being developed for Sun SPARC, Hewlett-Packard PA-RISC and other existing 64-bit platforms.

Interix-64 software will be backward-compatible with existing 32-bit applications. The software will let users run 32- and 64-bit Unix as well as 32- and 64-bit Windows applications on the same Intel-based machines.

Softway will release Interix-64 as soon as Microsoft releases its 64-bit version of NT, says Francoise Bollerot, Softway's director of product marketing.

Microsoft has been vague regarding delivery dates for 64-bit NT. Industry analysts estimate that the software could arrive as early as next year, given that Microsoft has built some support for the IA-64 platform into its upcoming Windows 2000 software. However, more conservative estimates say NT will not completely support 64-bit technology for another three years.

In spite of the delay, Softway's announcement of 64-bit support is well timed, says Mary Hubley, an analyst with Gartner Group.

"Sixty-four bit Unix is already out there, and corporate customers are looking for ways to protect their investments when developing applications for that platform," Hubley says. "If users can see a way to move those applications to a lower cost hardware/software combination in the not-too-distant future, they may be able to afford to build larger, more distributed applications," she says.

Softway: (415) 896-0708

PROFILE: SOFTWAY SYSTEMS

Headquarters:	San Francisco
Founded:	1995
Primary product:	Interix (formerly OpenNT), software for running Unix applications on Windows NT systems
CEO:	Doug Miller
Finances:	Privately held
Fun fact:	CEO brews his own beer for company outings.

Linux,

continued from page 17

student in Finland. Its popularity has spread through the Internet, from which thousands of programmers worldwide have been able to download the Linux source code for free.

A small number of companies also ship Linux to customers for profit. Those shipments increased from 236,000 units in 1997 to 748,000 last year, according to a study by market research firm International Data Corp. (IDC).

The IDC study also estimates that Unix market share for Linux grew from 6.8% of server operating system shipments in 1997 to 17.2% in 1998. None of these figures account for the free downloads available on the 'Net.

Analysts say Sun's strategy of embracing Linux makes sense for now.

"Sun is primarily interested in selling boxes," says Anne Thomas, a senior analyst with the Patricia Seybold Group in Boston. "I would imagine Sun doesn't particularly care whether it's running Linux or Solaris, as long as it's a SPARC box."

Linux is not a great competitive threat to Sun because relatively little software runs on the operating system. "There's still a lot more software available for Solaris than Linux," Thomas says.

What about the future, however, when Linux becomes more widely deployed?

McFarlane says Sun is keeping its options open.

"We're looking at Linux as a model, and we're also saying it may change business rules," he says.

But, he adds, "We haven't chosen yet to give Solaris source code away for free. There are 10 years of complex technology and third-party stuff involved in that." ◪

More
Online
• Read up on whether Sun should be worried about Linux's success.
DocFinder
FIND IT ➤ 1336 ON FUSION

Start-ups,

continued from page 17

Turquoise. The product looks at storage, hub, switch and host bus adapter device statistics, faults and activity, much as HP OpenView examines enterprise network gear. Turquoise will be based on the Common Information Model specification, which defines a standard way to represent management information.

The software will primarily be targeted at small and mid-size businesses.

Other network storage newcomers to look out for include:

- 3ware in San Jose, which is set on delivering Fibre Channel SAN products that small businesses can afford. "We don't see Fibre Channel presently creating a solution outside the glass houses [of large companies]," says Peter Herz, 3ware's CEO and president. "We're bringing the performance promises of Fibre Channel into the small and mid-size office at completely different price points." The company declined to reveal pricing information.
- Troika Networks in Westlake Village, Calif., is keeping mum on its products, which will be designed to speed SANs. The company has been cooking up its Fibre Channel hardware and related software for about two years, and is expected to release the software about midyear, sources say.
- Medusa Labs in Georgetown, Texas, performs Fibre Channel and SCSI product testing and training for users, such as Chase Manhattan Bank, and vendors, such as Gadzoox and Crossroads Systems. For example, Chase has stipulated that products must go through testing at Medusa before they will be considered for the SANs Chase will roll out late this year. ◪

New blood in the network storage market

Here's a sampling of start-ups expected to roll out SAN and related products in coming months:

Company	Founded	Product	Fun fact
3ware	February 1997	A high performance storage architecture based on low cost disk drives for small and mid size businesses.	CTO developed the 1st hot air popcorn popper — adapted coffee roaster.
Crag Technologies	November 1998	CT 3000 RAID subsystem	An audio clip at www.cragtech.com that tells you how to pronounce Crag.
DataCore	February 1998	Storage operating system code named Sonata (for OEM) and Symphony (for systems integrators).	CEO George Teixeira's first job was as a "banana hook" on the island of Madeira, where he was hung over the edge of cliffs to pick bananas.
Medusa Labs	June 1997	Fibre Channel and storage product testing for SAN market.	Fibre Channel is based on a paper Medusa Lab's founder submitted to ANSI in 1989.
SAN Solutions	May 1998	Code named "Turquoise"; to be announced in Q2.	Two company cats, Mikey and Dakota, greet customers.
Troika Networks	January 1998	Low latency, multiprotocol fibre channel products.	Founded by three cycling buddies.

e-business Accelerator

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Job Description:	Help companies exceed business goals by planning, designing and implementing e-business solutions.
Experience:	Increased information sharing at a global drug company by combining multiple e-mail systems into a single, secure intranet for 6,000 employees.
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Newbridge VPN gear helps users prioritize

Virtual private network gear offers various qualities of service to dial-up callers.

BY TIM GREENE

WASHINGTON, D.C. — Newbridge Networks last week introduced a scheme to set up virtual private networks (VPN) by piecing together newly upgraded hardware and software from its product line.

Under Newbridge's Multiservice Remote Access Solution (M-RAS) architecture, VPNs will not only support simple remote dial-up access, but also ensure that certain users' calls are given higher priority than others based on predefined management policies.

The company introduced M-RAS at ComNet/DC '99 here.

M-RAS relies on Newbridge's MainStreet Xpress 36100 Access Concentrator, which is a version of Advanced Computer Communications' Tigris Access Concentrator (TAC). The TAC includes software that enables the product to work hand in hand with other Newbridge gear.

The 36100 takes in dial-up calls and distributes them to Newbridge ATM backbone network gear. Pricing for the 36100 starts at $20,000, and it is available now.

A Newbridge MainStreet Xpress 36170 ATM switch determines the priority that calls should receive and forwards them via a switched virtual circuit that has the appropriate quality-of-service (QoS) level.

The switch determines which QoS to assign to a call based on three factors: subnet membership of the dial-up port; the physical port through which the call enters the switch; and the type of service bit in the IP packets.

While M-RAS will initially support only dial-up calls, Newbridge later this year plans to offer cable modem and digital subscriber line cards that will support broadband dedicated links into VPNs.

The 36100 can function as a simple terminal server and access concentrator, which is how it is being used at Elon College in Elon College, N.C., according to network administrator David Wall. But as he makes the network remote access more sophisticated, Wall plans to invoke more M-RAS features.

M-RAS enables users to set up VPNs on multiple 36100s without dedicating hardware ports to each virtual net.

This ability means that all the dial-up ports across a network are available all the time to any of a company's VPNs. During call setup, 36100 software determines which VPN the call belongs to and treats it accordingly.

On a call-by-call basis, the box can download software to the dial-up port so it can handle analog or ISDN calls.

The 36100 can also reject a call if a caller belongs to a VPN that is already using the maximum number of allotted ports. The switch can also let an extra caller onto a given VPN if enough modems are available.

The box tracks how oversubscribed that VPN is, and uses this information for billback purposes.

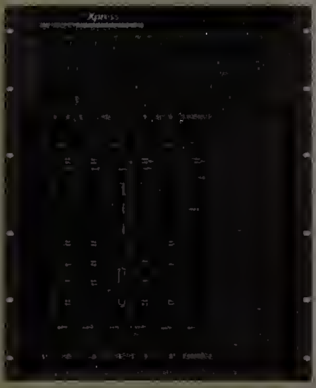
M-RAS can be used by service providers to enable thousands of VPNs at one time; such a network would be managed by a separate Newbridge box called the MainStreet Xpress 56020.

Newbridge: (613) 591-3600

Newbridge sets VPN goals

Newbridge Networks' M-RAS calls for multiple Newbridge boxes to set up secure VPNs:

- MainStreet Xpress 36100 – An access concentrator that takes in analog, ISDN and dedicated connections with an ATM uplink.
- MainStreet Xpress 36170 – An ATM switch that can be fitted with an internetworking card which gives the box routing capabilities to control up to 12,800 secure IP VPNs.
- MainStreet Xpress 56020 Routing Services Control Point – A device dedicated to setting routing policy for a network.


Newbridge's MainStreet Xpress 36100.

Correction

An Infrastructure story last week (*NW*, Jan. 25, page 19) included a graphic with a mislabeled product photo. The product shown should have been identified as Assured Digital's ADI-2500 VPN box.

Infrastructure . **Dave Kearns**

GET RID OF WINDOWS, AND GET YOUR MONEY BACK!

They say, "You can't fight city hall," which in modern geekspeak usually comes out as, "You can't fight Microsoft" . . . and win. But every war is a series of small battles, and not every battle is an assault on the citadel.

Geoffrey D. Bennett is a computer systems manager for NetCraft Australia and is also in charge of the company's Linux sales.

Bennett wanted to buy a new laptop to take on the road. Naturally, he preferred the Linux operating system to Windows 9x. What he found (and what many of us have found) is that it's next to impossible to buy a computer — especially a laptop — without some version of Windows installed.

Bennett spoke to salespeople and sales managers, but no one would sell him a laptop without Windows. Because he needed one anyway, he finally bought a Toshiba he liked, brought it home and turned it on. That's when he discovered his weapon.

When you first turn on a computer with Windows pre-installed, you're presented with the End User License Agreement (EULA). Few of us have probably read it, simply clicking the "I Agree" button so we can get on with life. But Bennett read the agreement, and he discovered this clause: "If you do not agree to the terms of this EULA, PC Manufacturer and Microsoft are unwilling to license the SOFTWARE PRODUCT to you. In such event, you may not use or copy the SOFTWARE PRODUCT, and you should promptly contact PC Manufacturer for instructions on return of the unused product(s) for a refund."

There it was: a way out! Bennett contacted Toshiba, Australia, and after a protracted discussion (read it at www.netcraft.com.au/geoffrey/toshiba.html — it's truly fascinating), actually got a refund ($110 in Australian dollars, which is about $70 U.S.) for the operating system he wouldn't use.

Hearing about Bennett's saga, the folks at Linux Mall (www.linuxmall.com/) are now promoting Windows Refund Day (Feb. 15, 1999) when they hope everyone wanting to run a non-Microsoft operating system on a new computer that already has Windows will demand a refund.

Microsoft claims it's just a public relations stunt by the Linux community and says that no manufacturer is required to ship Windows pre-installed. Call your local retailer or go online at www.dell.com/ or www.gateway2000.com/ and see for yourself if you can buy a desktop or laptop without Windows pre-installed.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at wired@vquill.com.

Tip of The Week

Microsoft has announced new, lower-priced licensing requirements for Windows Terminal Server, and Citrix has enhanced its MetaServer product to take advantage of the new licensing. If small footprint, network computer-like terminal devices make sense in your enterprise, take another look — especially if you'd like to provide application access to nonemployees or remote employees. For details, check out www.citrix.com/products/licqa.htm.

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Job Description:	Help retailers capitalize on the emerging opportunities of e-commerce.
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HANDHELD COMPUTING

IS leaps handheld hurdles, hops on hot technology

BY JOHN COX

Sales of handheld computing devices are soaring, forcing network managers to find ways to tie the new hardware into corporate databases and applications. Handheld pioneers face a wide range of issues, including firewall access, hardware and software management, and synchronizing data and applications.

> ***Firewall access, hardware and software management, and data and application synchronization lie ahead.***

The appeal of the new devices lies in how utterly unlike PCs they are in their light weight, portability and simplicity. By pushing a few buttons, users can access corporate applications, such as e-mail, and upload and download data.

"Corporations are still trying to understand handhelds and are learning all the issues," says Andrew Terry, chief technology officer for Advance Systems in Bristol, U.K., which sells software to connect handheld devices with corporate servers. "Usually the companies start off in known territory — e-mail, calendar and contacts."

But some companies are already rapidly moving forward, writing their own applications, for the first time computerizing employees with a handheld instead of a PC, and even creating systems designed for a single function, he says. For instance, one of Terry's customers wanted to use handhelds to record jet engine data during engineering work.

The basic tools seem to be in place for a fairly straightforward link to corporate nets, via modem, wireless or short-range infrared connections and built-in TCP/IP software. But it's not always quite that simple.

"If users want to use a Palm III [from 3Com's Palm Computing] to access their corporate e-mail via a Bell Atlantic wireless service, the IT group has got to poke a hole in the firewall for the telephone company," says Matthew Nordan, an analyst with Forrester Research. "There's not an easy way around that."

The network security staff at Anheuser-Busch in St. Louis required that a pilot project, using Hewlett-Packard HP 620 Windows CE handheld computers, go through the same net security procedure required of PC and laptop users. "It took me about 15 minutes to connect, and I failed three out of five times," says Rich Sleight, senior developer in charge of the project. "That's not acceptable [for handheld users]."

Instead, Sleight set up a single Windows NT server outside the corporate firewall. The 30 handheld testers tap a dial-up connection twice per day to upload data from surveys taken on the handhelds, and download HTML-based reports of the previous day's data. Sleight extracts the data and loads it into the corporate data warehouse.

The handheld dilemma

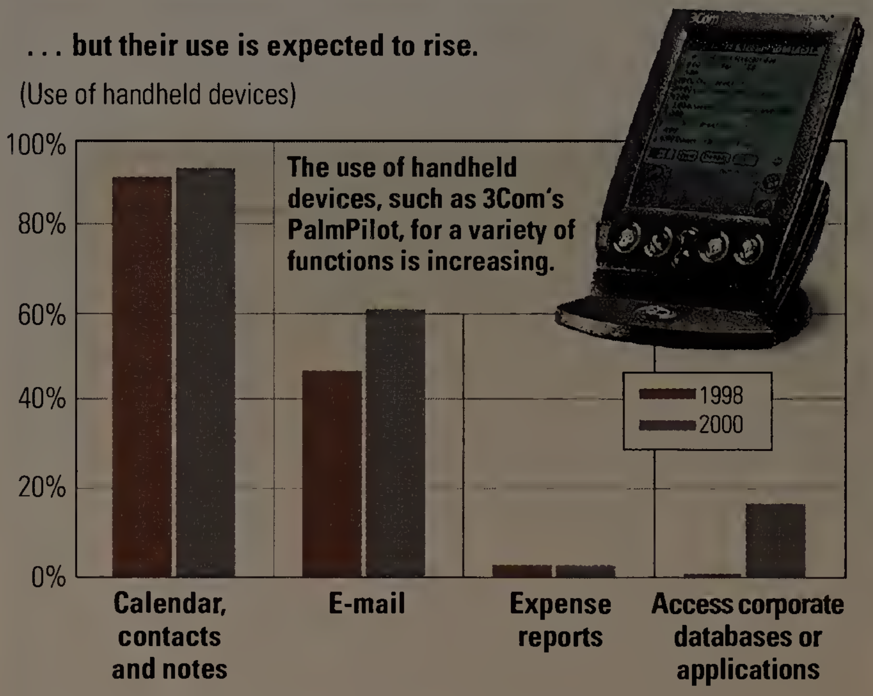
Corporate support lags for small devices . . .

(Laptops vs. handheld devices)

	Laptops	Handheld devices
Employees that have the device	100%	92%
Corporate IT group that buys the device	100%	32%
IT that supports the device	100%	44%

. . . but their use is expected to rise.

(Use of handheld devices)



The use of handheld devices, such as 3Com's PalmPilot, for a variety of functions is increasing.

Results show percentages of survey respondents whose employees use handheld devices, and the functions for which they are used.

SOURCE: FORRESTER RESEARCH, CAMBRIDGE, MASS

In most cases, corporate users are relying on software vendors and their partners to forge the necessary interactions between handheld devices and various corporate servers. This software can be an application package for a specific industry or middleware that helps make the data connections.

Nokia in Irving, Texas, is recruiting integrators and value-added resellers to create complete software packages that will tie Nokia's sleek 9000 Communicator, which combines a cell phone with a handheld computer and Web browser, into industry-specific applications on corporate servers.

Power in a palm

Some 500 people at Donaldson, Lufkin and Jenrette Securities use the PalmPilot to keep track of contacts and schedules. The next step, says Senior Network Support Specialist Eric Sanchez, will be to give the users access to their corporate e-mail. Sanchez is considering middleware such as Puma Technologies' server-based IntelliSync Anywhere to handle the synchronization.

"The barrier in the past was that the device linked only to your desktop PC," he says. "With Puma's and these other products, you can dial directly into the server."

Managing device users who are accessing corporate nets is difficult. "There are no good group-administration tools," says Forrester's Nordan. "And the management platform vendors, such as Computer Associates, Tivoli and Novell, have not addressed this space at all."

A Forrester report recommends three plans to bring order to what could become "device chaos." For handheld users focused on personal productivity and convenience, MIS can create a "synchronization service." This service could use middleware to link the devices with groupware services, along with file-sharing capabilities and e-mail forwarding to a wireless provider's e-mail service.

Second, MIS can act as a consultant for business managers who are evaluating software/hardware bundles that tie the device into an enterprise application. To support these deployments, MIS should define classes of service, price them on a per-user basis and negotiate fees with the manager to pay for support.

Finally, MIS can build and deploy custom applications. By relying on Internet technologies, such as optimized HTML pages and a caching Web browser on the handheld, developers can find these projects simpler to build, deploy and manage than traditional client/server projects, the Forrester report says. ◪

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Carriers & ISPs

The Internet, Extranets, Interexchange and Local Carriers, Wireless, Regulatory Affairs

Briefs

GTE Internetworking and **Cisco** last week rolled out a set of IP services that will be delivered over GTE's Global Network Infrastructure. The co-developed services include IP fax and Internet call waiting. GTE IP Fax offers features such as broadcast faxing, delivery confirmation, personalized inbox and e-mail integration. Internet Call Waiting lets users receive incoming calls over the same line they are using for Internet access. An incoming call will trigger a pop-up screen informing the user and identifying the caller. The user can answer the call or choose to ignore it, or tell the caller to call back. The services are available now.

GTE: (800) 472-4565

A group of state and national consumer groups has banded together to oppose **SBC Communications'** takeover of fellow regional Bell operating company **Ameritech.** Their report claims that SBC's takeover of Pacific Bell resulted in rate increases, extra user fees and "aggressive and misleading marketing tactics." The group also claims Ameritech shelved plans to enter out-of-region markets once merger talks with SBC began. The full report is available at www.mo-opc.org/new/sbcamerimerger.htm.

AT&T last week reported $1.98 billion in income for the fourth quarter of 1998, ended Dec. 31. The company also announced total revenue of $13.53 billion, an increase of almost 5% for the quarter. This was the fourth consecutive quarterly increase in revenue, AT&T says. The company's business services, wireless services, Teleport Communications Group, Inc., AT&T Solutions, international operations and ventures, and AT&T WorldNet all contributed to the revenue growth, the company says.

Crowe: Competitors in the wrong race

NetworkWorld Q&A

Recently, Level 3 Communications audaciously promised by year-end to provide long-distance voice services at 3 to 4 cents per minute, some 20% less than its competitors' rates. Rates will drop even further, says Level 3 President and CEO James Crowe.

Crowe recently spoke with Network World *Senior Editor Tim Greene about what the future holds.*

Will you be offering multiyear voice contracts right away?

Whenever you are a new entrant in an established market, you cannot have the hubris to walk in and think you are going to change the entire structure overnight. So we start out thinking we need to be able to provide pricing that customers can understand and relate to. But over time, you bet.

What will your network look like when it is completed?

If you look at what is coming out of technology providers today, I think there is a fairly general agreement that you are going to have an IP layer running over maybe a very thin SONET layer — but it will be very thin — running over an optical layer where you can switch wavelengths. We think that's the right direction. In the world of market-based technological standards, predicting the future is perilous.

A while ago, we talked to Qwest CEO Joe Nacchio, and we asked him to talk about Level 3.

He didn't tell you that we're in the Indy 500 and he's in mile 300 and we're still building our car, did he?

No, he didn't use that metaphor, but it's pretty close.

If Joe had the right race I'd agree with him. But Joe is building a car to race in the Indy 500 and we're building a Space Shuttle to get to the moon. Joe is building a current-generation network dependent on circuit switching for a vast majority of his revenue, thus Qwest is headed down the same path the current set of legacy providers are. And I suppose he'll unplug the circuit switches and plug in the routers when the technology is there.

When it becomes obvious that IP is the superior technology, Qwest will be in the same position that IBM was in when it was obvious that the PC and client/server was the right business model. You've got technology, not just individual pieces, but all of your IT infrastructure that's invested in the past.

What is a good time frame for when corporations are going to be running pretty much all their voice and data over IP?

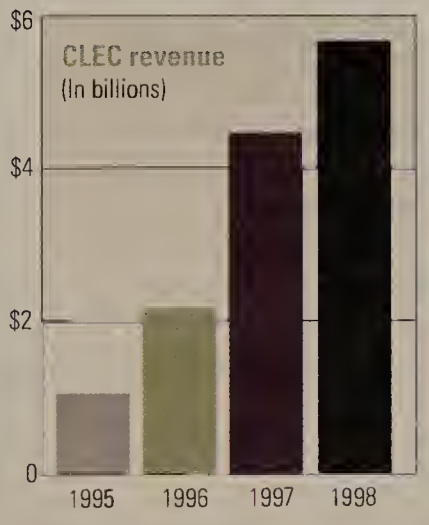
(Whistles.) I will be the first to say that when you add market-based technical development to any industry, you increase the unpredictability associated with that industry. Hey, the phone business was really predictable. With that caveat, I think you are going to see, among larger enterprises, IP as the dominant transport mechanism over the next five years for voice. That does not mean 100%, that just means more than 50%.

What are your thoughts on virtual private networks (VPN)? Is that what everybody's network is going to look like?

Today, people are moving to IP because of the obvious benefits of standardized interfaces. But you can't get the kind of reliability out of the public IP networks that you need. I have no doubt customers are already starting to develop commercial-quality IP networks out of necessity using ATM to carve out fairly expensive VPNs. Tomorrow, using some QoS and prioritization scheme, such as Multiprotocol Label Switching, customers are going to be able to set up thousands or tens of thousands of VPNs on a commercial-quality IP network and get the same features you have to pay a ton of money and a lot of in-house expertise to do today. ◪

You've come a long way, CLECs

Competitive local exchange carriers mark their progress:



The CLEC industry has grown dramatically since the Telecommunications Reform Act of 1996. Whereas competition prior to the act was limited to major cities, CLECs now offer services in more than 350 large urban markets, according to the Association for Local Telecommunications Services.

Since the Telecommunications Reform Act:

- CLEC switch installations have grown from 65 to 667 nationwide.
- Access lines sold by CLECs have increased by 600% to 5.1 million total lines.
- The number of CLECs has increased from 13 to 146.
- Fiber optic cable owned by CLECs has increased 373% to 80,000 miles.
- The CLEC industry has created 18,000 new jobs.

SOURCES ALTS, WASHINGTON, D.C. AND NEW PARADIGM RESOURCE GROUP INC., CHICAGO

More Online

- A complete transcript of the interview.
- Background information on Crowe and Level 3.

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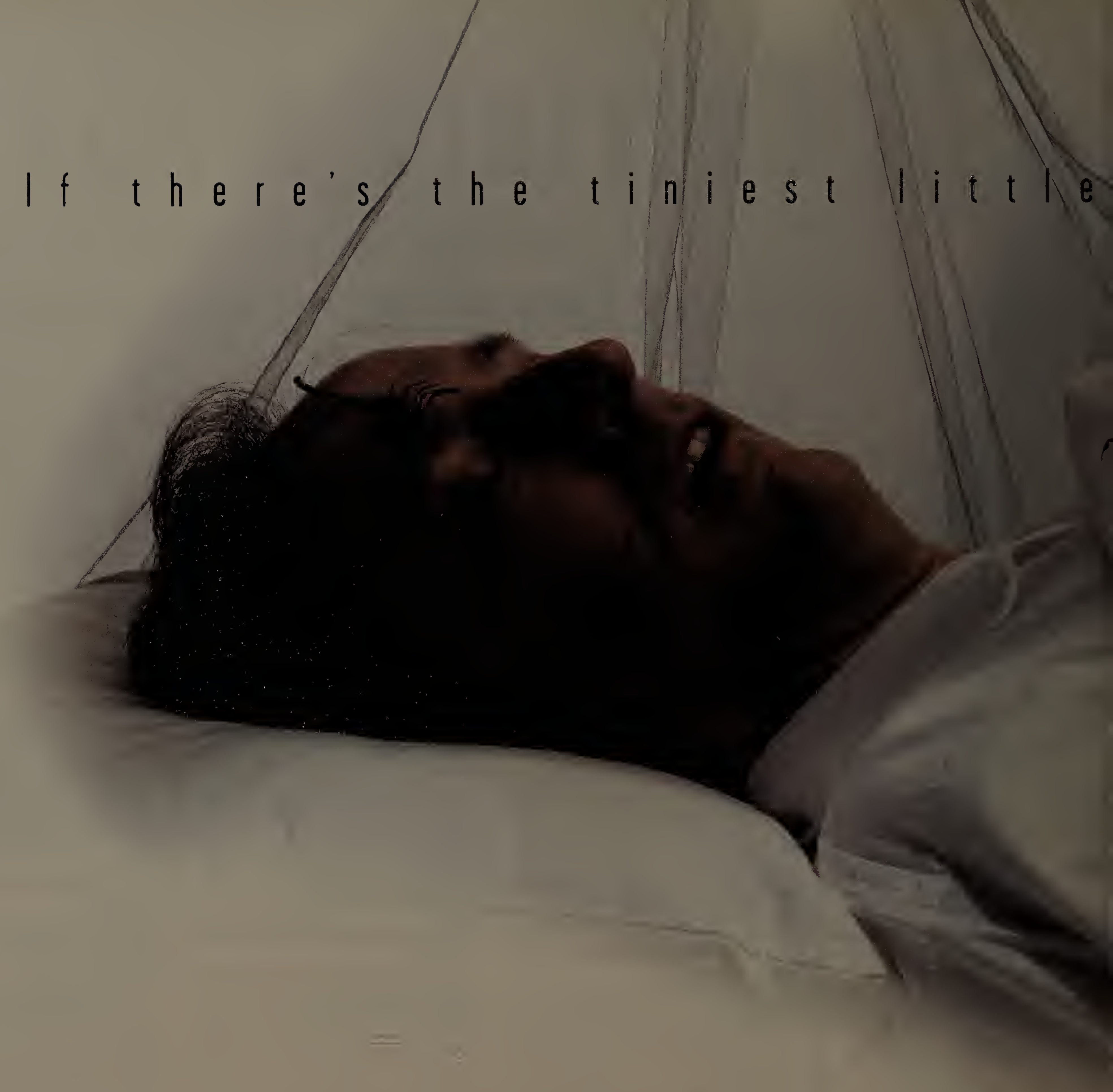
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Wan Monitor . Daniel Briere and Christine Heckart

LOW-COST DSL, CABLE CARRY BOTTLENECKS

Many common phrases come to mind when writing this column: “Beware of Greeks bearing gifts,” “Caveat emptor (Let the buyer beware),” just to name a couple. But here's one in plain English: Be careful of low-cost access services.

SBC Communications fired a massive shot across the bow of just about every major cable company, telco, competitive local exchange carrier, ISP and satellite access provider when it reduced its digital subscriber line (DSL) access pricing by 45% to $39 per month (plus $10 for Internet access). Your $49 gets you a 384K bit/sec service. We figure this cost is aggressive enough to spur the mass deployment of DSL services.

This is a great deal for remote users and small businesses. You get guaranteed bandwidth in the local loop that cable modems — which share the local bandwidth — don't offer, and you get the low cost that cable modems provide. SBC has sent a strong, competitive signal, and rival providers are studying this DSL development.

Why? Well, as Concentric Network's Chief Technology Officer Jim Southworth said in our newsgroup (www.xdsl.com/alert/discuss), “This will certainly separate the players from the wannabes. This could initiate the DSL deluge that people have been anticipating. This is going to be the year in which you can get really low-cost DSL in a large number of places.”

So what's wrong with that? Well, most ISP backbones are not ready to deal with the potential traffic that volume low-cost DSL services could generate. Some larger ISPs, such as Concentric, have anticipated this, “But that doesn't mean the pricing of our backbone transport has caught up with what is breaking loose here,” Southworth said.

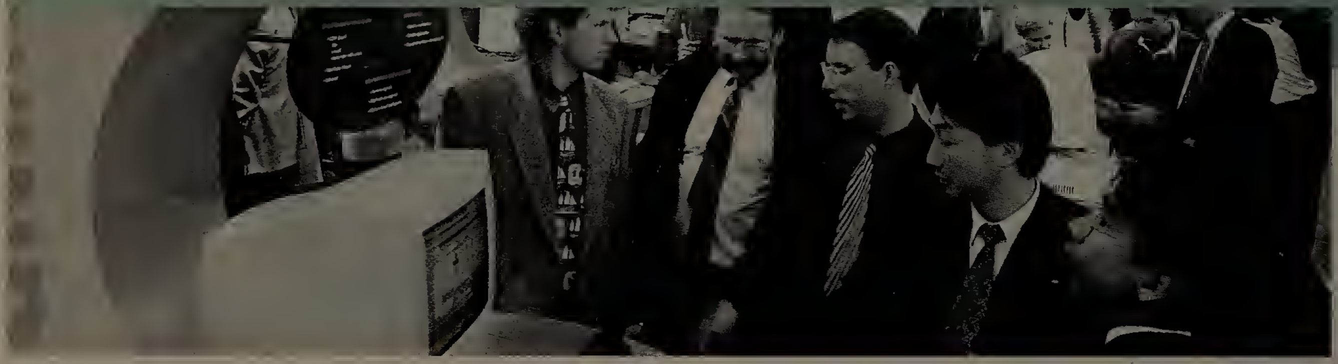
For example, smaller ISPs that have only taken a single T-1 to connect to regional Bell operating companies are in for a few surprises. Today it only takes one high-power user to melt them down. Incumbent local exchange carrier backbone oversubscription must also be considered. With prices so low, SBC probably will have to increase levels of oversubscription to the Internet. We wonder how many simultaneous users it will take to affect the performance of the system.

Here is where the “premium ISPs” will differentiate themselves with 24-7 service, service-level agreements (SLA) for their high-end users and a slightly higher price in some cases.

Look for those choices when you buy into inexpensive access options. You won't get them anytime soon from cable modems, but there are DSL options that will offer SLAs. Some cable companies have stated they will address SLAs to make their products more appealing to the business market, so SLAs might only be a short-term differentiator.

Pricing will go nuts in the DSL industry as vendors scramble to react to SBC's lower prices. Southworth predicts: “You will see a whole suite of performance measurement tools being used by various customers to judge the actual performance of various vendors and ISPs.”

Briere is president and Heckart is vice president of TeleChoice, a consultancy in Boston. They can be reached at dbriere@telechoice.com and checkart@telechoice.com, respectively.



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Briefs

E-commerce software and service provider **Pandesic** unveiled the latest version of the Pandesic storefront, a product based on the SAP R/3 enterprise resource planning system and Microsoft's Active Server Pages. Pandesic 3.0 now has a customer-service call center application and storefront features such as coupons, cross-selling and a way to manage multiple warehouses.

The product costs $25,000 plus a 1% to 4% fee on sales transactions.

IntraSoft has just shipped KeyVision 3.0, a tool for the enterprisewide management of Windows systems and applications configuration. The new release is integrated with the company's Registry Resource database, which contains configuration information.

KeyVision 3.0 works with IntraSoft's database.

A 25-user version sells for $1,250.

IntraSoft: (800) 841-2031

Customizable Web messaging graphical user interfaces are the highlight of IMail Server 5.0 for Windows NT from **Ipswitch,** of Lexington, Mass., the company said last week. The upgrade also includes Web-based administration capabilities, antispam features and support for Open Database Connectivity, Lightweight Directory Access Protocol Version 3 and return-receipt notifications.

IMail Server 5.0 costs $995 for a 250-user license and $1,495 for an unlimited user version.

Ipswitch: (781) 676-5700

IN-SITE: *Lessons from Leading Users*

Marimba solves Home Depot data dilemma

BY ROBIN SCHREIER HOHMAN

Next time you saunter into Home Depot looking for a can of paint in Gustavian blue gray, think about this: the IT department in the retailer's Atlanta headquarters has to send updated databases to 754 stores — every night.

And not just for paint. IT also has to send the databases for design systems for kitchen cabinets, decks and mill work (windows and doors).

"We were killing our WAN sending out these data sets," says Curtis Chambers, manager of distributed architecture at Home Depot. The company uses STA, a File Transfer Protocol-type system that doesn't allow incremental downloads.

The company faced a dilemma: either figure out a way to speed up the nightly updates or upgrade the network.

That kind of upgrade wouldn't be just wood shavings for a company like Home Depot. It had sales of nearly $8 billion in the third quarter of 1998 alone and is adding a new retail store nearly every two days.

MICHAEL A. SCHWARZ

With Castanet, Mike Anderson's downloads went from 80M bytes to 1.2M bytes.

The IT department has four IBM mainframes linked together, and the headquarters' databases reside on Hewlett-Packard servers. Each store has its own HP D270 Unix server, and often no IT employee.

Mike Anderson, Home Depot's vice president of technology, tries to schedule updates when the stores are closed. This is still a chore because the databases can hold 60M to 80M bytes. So Anderson took a look at Marimba's Castanet Infrastructure Suite and did the math.

The Castanet Transmitter sits on a server and automatically sends applications and data over an intranet, extranet or the Internet. The most important feature for Home Depot is the ability to send differentials — just the changes to a database or a file.

With four databases per store, Anderson is sending around 320M bytes of information to each store, every night. If a connection fails, the system has to resend the entire update; there's no way to resume the download. But with Castanet, he can send just the

See **IN-SITE**, page 32

Lotus bangs the knowledge management drum

NetworkWorld Q&A

Mike Zisman is "The Man" when it comes to articulating the Lotus vision of what can be a nebulous emerging technology: knowledge management. At the recent Lotusphere '99 in Orlando, Lotus' executive vice president for strategy discussed the area with Network World *Senior Editor Paul McNamara.*

Do most people understand the knowledge management concept yet?

At every customer meeting I have had this week — and I've had a lot — knowledge management has been a major topic and, in every case, there has been some knowledge management initiative going on at those companies.

Do they actually use the phrase, and is there any general agreement on what knowledge management means?

They do use it, although not everyone agrees on what it means.

For our purposes, we have defined knowledge management as having five technical pillars: collaboration; business intelligence; knowledge transfer/distributed learning; content searching/categorizing; and expertise (mapping).

Additionally, there is another horizontal pillar, and that's methodologies. We hear over and over again that technology is a piece of knowledge management, but if you don't have the methodologies and the processes and the cultural issues in hand, you're going to have more failures than successes.

See **Zisman**, page 32

> **"Will this [knowledge management] market grow at 100% a year? Yes, I think so."**

Mike Zisman, executive vice president for strategy, Lotus

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'Net Insider . Scott Bradner

BUSY DAYS ON THE CRYPTOGRAPHY FRONT

France is giving up, Deep Crack strikes again and the Feds seem to partially get it. Encryption is in the news again, and the implication is that many organizations should review their data security policies.

France has long been quite antagonistic toward encryption, with most domestic uses of encryption technology outlawed. The only permitted mechanisms include mandatory key escrow, in which the government gets to keep a copy of the encryption key.

So it came as quite a shock when the government of France two weeks ago proposed to eliminate all controls on the use of encryption within the country. The announcement specifically pointed out that good, strong cryptography is essential to protecting the confidentiality of communication and for privacy. The announcement said it is futile for the government to try to keep encryption technology away from criminals because it is just too widely available.

Meanwhile, the Electronic Frontier Foundation's Deep Crack special-purpose crypto key breaker put in an impressive showing. Working with 100,000 PCs on the Internet, it took the key breaker less than 23 hours to find the secret key that encrypted a test message using the U.S. standard encryption algorithm, Data Encryption Standard (DES).

The U.S. Department of Commerce just recommended abandoning DES and is proposing Triple-DES instead. In its draft proposal (http://csrc.nist.gov/fips/dfips46-3.pdf), the Commerce Department admits that it "can no longer support the use of single DES for many applications."

The department also states that "Single DES will be permitted for legacy systems only."

This comes a few weeks after the U.S. government relaxed, but did not eliminate, controls on the export of cryptographic technology from the U.S. (www.bxa.doc.gov/Encryption/1231ERC.htm).

The underlying message in these stories is that good crypto is important to good data and network security. The U.S. government claims to be quite worried about the security of the Internet.

The U.S. Department of Justice has just created a program to fight attacks on data networks in response to a call by the President's Commission on Critical Infrastructure Protection (www.pccip.gov/). But this same government recently persuaded 32 other countries to extend the Wassenaar Arrangement, adding new restrictions on the export of cryptographic technology to many parts of the world. The U.S. government has not yet determined what the French government has, namely that restrictions only ensure that the bad guys have good access to the good guys' information.

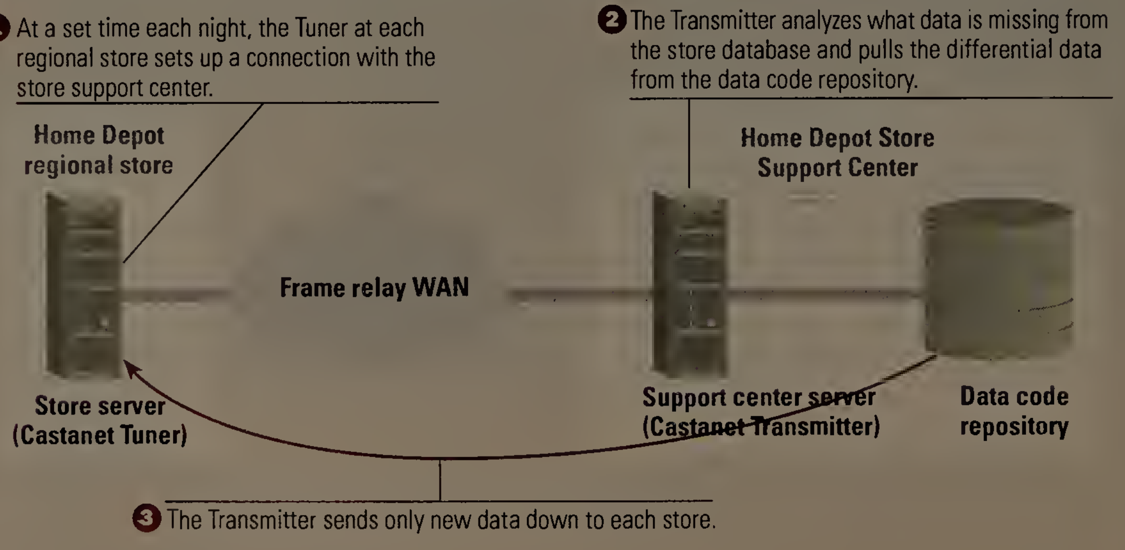
The lesson of all of the above is that anyone using DES or any other encryption that employs keys shorter than 128 bits should start planning to migrate to something stronger, such as Triple DES. And if the data is very valuable, the plan should be fast-tracked.

Disclaimer: Fast-track and Harvard do not belong in the same sentence, so the above must be my observations.

Bradner is a consultant with Harvard University's University Information Systems. You can reach him at sob@harvard.edu.

Automated database updating

Home Depot now sends entire databases to each of its 754 retail stores to update pricing and inventory information every night. Using Marimba's Castanet Infrastructure Suite, the Castanet Transmitter will send only the new data, saving time and bandwidth. The Castanet Tuner, on a server at each store, will receive the data, unpack it and update the databases automatically.


Home Depot regional store
Frame relay WAN
Home Depot Store Support Center
Store server (Castanet Tuner)
Support center server (Castanet Transmitter)
Data code repository

❶ At a set time each night, the Tuner at each regional store sets up a connection with the store support center.

❷ The Transmitter analyzes what data is missing from the store database and pulls the differential data from the data code repository.

❸ The Transmitter sends only new data down to each store.

IN-SITE,
continued from page 29

differential data. So instead of sending 80M bytes, he can transmit a total of about 1.2M bytes, about the amount of data that fits on single floppy disk. Instead of taking hours to update one database, Anderson says he'll be able to do it in 30 seconds.

At each store, Castanet's Tuner will automatically receive the updates and merge them with the store's databases. The Tuner also has built-in protection so it doesn't overlay an active file. Instead, it downloads the file, and the Tuner keeps trying to update it until it succeeds. The Tuner can also install and launch applications. Home Depot may eventually use this feature to update code.

Currently, Home Depot runs an AT&T frame relay network with T-1s to every store, sending data and voice traffic on different channels. Anderson is looking to switch to ATM so he can multiplex data and voice.

Chambers has been lab-testing Castanet for several months and says he's had no problems running it over IBM AIX, Sun Solaris, HP Unix and Windows NT because the code is written in Java. The rollout is scheduled for later this month.

Chambers says payoffs will not just be speedier downloads: "It's letting us use our existing network technology for a little while longer." ◪

Zisman,
continued from page 29

Are those cultural issues a major sticking point?

Yes. When you start to pick away at that, what you will find is that the root cause most of the time is that, quote, "People are unwilling to share information."

If there's much of a barrier for me to share that information, I'm not going to do it.

People say that's a cultural problem, but, if you step back you'll ask, "Were the incentives there to really make it easy enough for people to share information?"

Can you quantify the success of this market to date?

It's a little bit hard to quantify. What part of the collaboration market, which is a roughly $2 billion market, can you call knowledge management? What portion of the business intelligence market can you call knowledge management?

I looked at a research piece from Lazard and they actually attempted to do that. They show a very rapidly growing market, from about $8 billion in 1998, of which $6 billion was services, to about a $65 billion market in 2003, of which slightly less than half is services. They're showing the product part of knowledge management growing from about $2 billion to $30 billion.

Will this market grow at 100% a year? Yes, I think so.

What's Lotus' best hope here?

Our biggest knowledge management initiative in the next three years from a revenue standpoint undoubtedly will be distributed learning.

What are the potential pitfalls for overall market growth?

If people try to simply throw the technology out there without a focus on methodology, process and culture, they're going to fail. We'll see a lot of well-documented failures, and people will say this technology does not work. ◪

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A look at Lotus' knowledge-management strategy.
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Technology Update

Evolving Technologies
and Standards

Exposing the deep, dark secrets of TCP/IP

BY BRAD TURNER

Over the past few years, one of the most written-about network topics has been IP. But even with all this attention, few, if any, stories have traced the protocol's basic workings, that is, how routers and Layer 3 switches act upon IP information to move Ethernet packets across the network.

As a point of reference, bear in mind that IP is a member of the TCP/IP protocol suite.

TCP functions at the Open Systems Interconnection (OSI) transport layer, or Layer 4. Its chief responsibility is to ensure reliable end-to-end connectivity. IP, located one layer down, at the OSI network layer, or Layer 3, communicates the addresses of each packet's sender and receiver to the routers along the way. Routers and Layer 3 switches can read IP and other Layer 3 protocols. This information, combined with routing tables and other network intelligence, is all it takes to get across the room or around the world via TCP/IP.

The routing process begins with an IP address that is unique to the sending endstation. Endstations may be assigned permanent IP addresses or they may borrow them as needed from a Dynamic Host Configuration Protocol (DHCP) server or other service.

Each packet carries a source address, which under current (IPv4) specifications is 32 bits long. In its header, each packet also carries the IP address of the final destination.

If the sending endstation determines that the destination address is not local, the packet goes to a first-hop router, typically one that is close and has been preassigned to the sender.

Decisions, decisions

The router inspects the packet's IP address and performs a route table lookup to see if the destination endstation resides on the local (physically connected) network, typically called an IP subnet. An IP subnet usually is assigned to each of the router's network interfaces.

If the destination IP address is local, the router searches an internal store of IP addresses and local-device media access control (MAC) addresses. This store is known as the Address Resolution Protocol (ARP) cache. ARP is the universal tool for matching IP addresses to MAC addresses. If the destination's MAC address appears, the router installs that MAC address in the packet header (removing its own MAC address because that's no longer needed) and sends the packet to the destination endstation.

In the event that the destination MAC address does not appear in the ARP cache — it might have timed out, for instance — the router must broadcast an ARP request to the subnet referenced by the packet's destination IP address. The endstation with that IP address responds, sending back its MAC address. The router updates its cache, installs the new MAC address into the packet header, and launches the packet.

If the route table lookup shows that the packet is destined for a nonlocal subnet, the router forwards the packet to the next-hop router using the next-hop router's MAC address. Routing tables are continuously built and rebuilt by intelligent discovery protocols, such as Routing Information Protocol or Open Shortest Path First. Each router's routing table shows the best route to the destination address; for addresses that may be several hops away, it shows the best next-hop router.

The next-hop router then performs its own route table lookup. If the packet destination is not local, it sends the packet to the next-hop router. If it is local, the router searches its own ARP cache for the endstation MAC. And if it doesn't find the MAC address, the router broadcasts an ARP request to its local subnets.

This process is repeated until the packet reaches its ultimate destination.

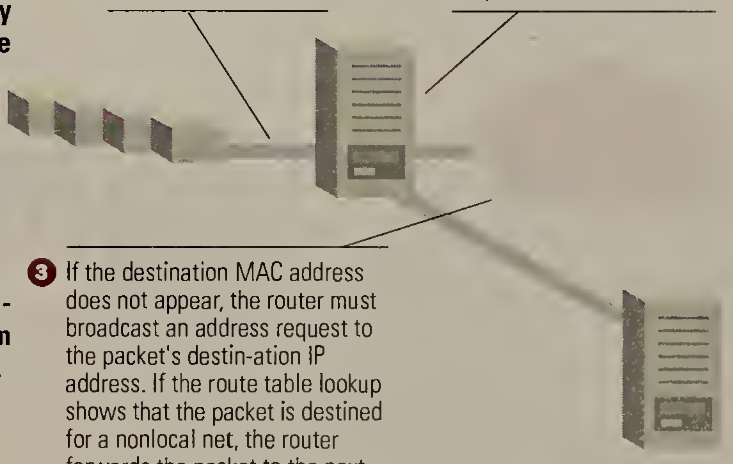
One danger that exists in multihop transmissions involves the creation of infinite loops, where a misconfigured router sends the packet back to a router through which it's already passed. To guard against infinite loops, IP includes a time to live (TTL) function, which sets a time limit for how long the packet can traverse the net. With each hop, a preset TTL value is devalued by one; if that number reaches zero, the packet is dropped and the router notifies the originator via an administrative Internet Control Message Protocol message.

Turner is a technology marketing manager in 3Com's Large Enterprise Division. He can be reached at Brad_Turner@3Com.com.

HOW IT WORKS

IP routing

TCP/IP is designed to ensure reliable end-to-end connectivity. The mechanism that ensures data delivery is simple in structure but complex in operation. At the heart of IP routing is the routing table and other onboard intelligence that makes it possible for users to communicate across the room or around the globe.



❶ Router inspects incoming IP packet address and performs a route table lookup to see if the packet's destination is a local network.

❷ If the IP address is local, the router searches an internal store of IP addresses and local-device MAC addresses. If the destination's MAC address appears, the router installs that MAC address in the packet header and sends the packet to the destination.

❸ If the destination MAC address does not appear, the router must broadcast an address request to the packet's destin-ation IP address. If the route table lookup shows that the packet is destined for a nonlocal net, the router forwards the packet to the next-hop router, using the next-hop router's MAC address.

By
Steve
Blass

Ask Dr. Intranet

In our student laboratory, I use NetWare 4.11. I would like to connect a 33.6K bit/sec external modem so students can access the Internet from Windows 95 workstations, but I only have one IP address. How can I install the modem in NetWare 4.11 and provide 'Net access with only one modem and one phone line? Access to our ISP is unlimited dial-up using PPP.

Remigio Taga, Mindanao
Polytechnic State College,
Cagayan de Oro, Philippines

With Windows and NetWare, IP isn't as tightly integrated with the operating system, but it can be done. Set up your workstations to talk TCP/IP by going to the Network Properties dialog box. For your lab machines, use IP addresses from the private IP address space described in RFC1918. Give the workstations permanent IP addresses from the private address space or use the Dynamic Host Configuration protocol (DHCP) to assign IP addresses dynamically. You can find DHCP server programs for Windows at www.microsoft.com/nts/exec/ vendors/ freeshare/DNS.asp. I've used DHCPDNT with Windows 95.

Once your lab machines can talk IP, configure the workstation with the modem to act like a network address translation firewall. Programs are available at www.microsoft.com/nts/exec/ vendors/freeshare/Special.asp. I've used Firedoor for a configuration similar to yours.

As a network architect at Houston-based Sprint Paranet, Blass understands the strain of developing and managing intranets. Send your problems to dr.intranet@paranet.com.

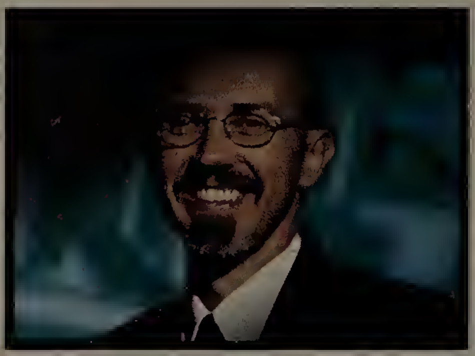
Gearhead — inside the network machine . Mark Gibbs

SERIOUS ABOUT SECURITY? WHO THE X.509 ARE YOU?

Perhaps the greatest and most perceptive joke about the Internet appeared in *The New Yorker* in 1993. It depicted two dogs, one sitting on a chair in front of a PC and the other sitting on the floor looking up at the first. The dog on the chair was saying, "On the Internet, nobody knows you're a dog."

This quip raises the question: How do we know whom we are exchanging messages with on the Internet? There are a lot of technologies that provide parts of the answer, such as Public/Private Key (PPK) encryption and public-key infrastructure (PKI), but one technology has become foundational to the whole issue: Digital Certificates. (For more on PKI, see page 37.) And the most important standard in this area is X.509.

Wondering what this standard is? Well, Gearhead is here to help. X.509 is a standard from the International Telecommunication Union-Telecommunications Standardization Sector (ITU-T) and the ISO/International Electrotechnical Commission (ISO/IEC). First published in 1988 and extended in 1993, the current version (3.0) was released in 1996.



An X.509 certificate is a block of data divided into 11 major parts. The first section is the X.509 version field. The next is the certificate's unique serial number assigned by the certification authority that issued the certificate. Following that is the signature algorithm identifier that names how the authority signed the certificate.

The next fields identify the certificate's issuer, spell out the validity period of the certificate (start and end dates) and provide the name of the certificate's owner and the owner's public-key information.

Following that are optional sections: issuer- and subject-unique identifier fields allow items to be reused, and the extensions field provides additional information for the control and management of the certificate.

The final part of an X.509 certificate is the certification authority's digital signature. This field is generated by examining all the other fields in the message to create a "message digest," a value that describes the contents of the fields. This digest is then encrypted with the certification authority's private key to create the signature value.

That's what X.509 is — a specification of the layout of digital signatures But in practice there's a whole slew of implementations for Internet Explorer and other software packages.

With Microsoft Outlook, you can opt to sign a message by attaching your digital certificate. When the recipient receives the certificate, the certification authority is determined by looking at the issuer identification field. The e-mail program then goes to the authority's Web site and gets the authority's public key. The public key is used to decrypt the signature to reveal the value of the previously determined message digest.

This value can then be compared to a newly calculated message digest and, if they are the same, the certificate is valid and unmodified. That is, valid unless the certificate has been revoked, for example, because the certificate's owner has left the company.

To determine the status of the certificate, the certificate authority must be interrogated. A message encrypted with the authority's public key is sent to the authority with the certificate's serial number and the process' public key. The authority responds with an answer, effectively yes or no, encrypted with the process' public key.

So, we've established that the message contents are intact and unmodified and that the sender's certificate is valid and current, which implies that the sender is who he claims to be.

The importance of X.509 is that it is a stable standard that will underpin everything you do with PKI in your organization. But is there a real market for it? Well, digital certificates based on X.509 Version 3.0 and related services were expected to reach $56 million in 1998 and, according to a Dataquest report, be worth some $92 million by 2000. Could we finally be getting serious about security?

Comments and suggestions to gb@gibbs.com.

News, tips and tools from our Web site

Put down your bats?

Our recent article about system administrators going after hackers with baseball bats continues to generate debate.

"I doubt if any major financial institution would be stupid enough to condone Mr. Cipher's actions," one Fusion user wrote in our forum about the pseudonymous system manager we profiled. "Cipher poses more of a threat to society than Kevin Mitnick ever did — Mitnick at least never beat anyone up with a baseball bat." (Mitnick is an infamous hacker in jail for stealing credit card numbers).

"I'd say that more than 95% of apparent attacks either turn out to be a misconfigured system on the originating host or unauthorized misuse of that host," writes another. "Any 'cowboys' who would blindly counterattack, given the odds of attacking a nonperpetrator, is an idiot who shouldn't be allowed access to a network and certainly shouldn't be granted credibility or anonymous protection by the press."

Others pointed out one danger of massive electronic retaliation: Hackers often break in from other systems they've cracked, so a counterattack could wind up hurting an innocent victim.

But still, some say hackers should be hit hard, if possible.

"There's a time and place for everything," wrote one user. "And yes, I do support countercracking in those instances where the assets under attack justify a strong response and if it can be done with no collateral damage."

One person who saw his machine crashed by an intruder wrote: "If I could find the physical being responsible for this . . . well, let's just say me and Mr. Cipher would have some common interests."

Meanwhile, our online insta-vote (completely unscientific, we'll grant you), shows that 54% of respondents think "in-kind" retaliation is acceptable, while 44% say victims should go to the authorities.

Follow the debate, and then jump into it at:

DocFinder: 1333

Hackers vs. crackers

Some people have raised an issue with our descriptions of system intruders as "hackers."

John David wrote in to say we're corrupting a noble term for "someone who would obsessively try to learn everything there is to know about a particular subject, like a computer operating system, the way a radio works, the way the human body works, human perception, etc."

By calling crackers "hackers," "intellectualism has been villainized. I do not believe this is an overstatement of the situation because of the aforementioned history behind the term 'hacker,'" David says.

What do you think?

DocFinder: 1334

Download of the week

Isn't the World Wide Web grand? Just point, click and wham — you can download hundreds of megs of demonstration and evaluation software (and even valuable free software — just look at Linux). But how do you find what you're looking for?

Starting this week, we'll highlight applications that might be worth a look. You can find these, plus scores more to try in our new Downloads area.

For example, Jigsaw 2.0 is a free Web server from the World Wide Web Consortium written in Java. It supports HTTP 1.1, Java servlets (but of course!) and server-side "includes." It can run on any platform with a Java Virtual Machine.

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Editorial Insights

Chips ahoy! How C-Port could shake things up

In a piece called "The Fabless Phenomenon," (www.nwfusion.com/news/0302fab.html) published last March, we told you about a new breed of semiconductor manufacturers that promises to rock the industry by building low-cost chips that deliver powerful network capabilities.

Last week, I met with a company that plans to push the network chip revolution even further. If C-Port Corp. achieves its goals, you will get not only more powerful, less expensive net devices, but you also will be able to keep the gear longer while adding functionality.

C-Port's goal is to create a common microprocessor platform, supporting a variety of network functions, that software developers can easily customize with innovative features.

Call it "C-Port Inside." By giving device manufacturers basic building block functions and programming interfaces, C-Port (www.cportcorp.com) could free the manufacturers from having to be experts in costly chip design. The vendors can divert their resources to building unique — and more profitable — software features.

Having a standard chip platform might benefit customers in a number of ways.

- Vendors could stop competing on speeds and feeds and start focusing on delivering new policy management, quality and other advanced features faster.
- Network gear would last longer because new features could be deployed without hardware upgrades.
- A software industry could develop to build new features and tools for network gear — much like the PC software industry grew around Intel's platform.
- Competitors could spring up more easily because they wouldn't have to build their own chips.
- Customers could build their own functions on top of the chip platform and could pressure vendors to deliver new features more quickly.

C-Port's goals are lofty, and the company will face a number of challenges in order to make good on them. But C-Port has strong management and venture backing, and it seems to be winning over some big players, like Nortel Networks, to its vision.

Keep your eye on C-Port. It may just bring about a sea change in networking.

— John Gallant
jgallant@nww.com

Message Queue

NOT A CURE-ALL

Regarding Mary Petrosky's column "Beware the cult of IP" (Dec. 21, 1998, page 39):

I agree that IP is just one of the technologies in users' toolkits. It clearly wins in the application space. However, IP is yet to be proven as a reliable, multiservice transport technology for bits, bytes, cells, frames and packets.

My observation is that even if the whole world goes IP, there will always be a need for highly reliable, highly secure, "don't look at my IP header" physical and logical private lines to serve business users. At this time, IP as a transport infrastructure to serve these users just doesn't compute.

Tony Rybczynski
Director, strategic marketing and technologies
Nortel Networks
Ottawa

GET HAPPY

Regarding Mark Gibbs' column on how IT professionals can gain/regain respect ("Power to the people," Dec. 28, 1998/Jan. 4, 1999, page 94): I work in state government, and I work with computers. From many perspectives, I have two strikes against me.

A common misconception is that all government workers are lazy, stupid, power-hungry tyrants. I have a technical background. Again, a common misconception is that because I can manipulate a database, format a hard disk, capture a packet on a wire, install a circuit board and so forth, I have little ability to speak and understand English.

My current position deals with the implementation and operation of an enterprise data warehouse for our department and provides a great blend of working with computers and people. I really enjoy what I do and think my work is important.

I'm not sure computer professionals are any more or less happy with their jobs than people in other professions, but I find it a bit sad that my enthusiasm is abnormal. If you're not excited about what you do, who else will be?

Nina Terhaar
St. Paul, Minn.

THE LINE ON LINUX

Your article "Linux vendors crank out new features" (Jan. 11, page 6) contained some misleading statements.

First, there is a graphical user interface that is included with most distributions of Linux: XFREE86. Also, Linux clusters do exist and have for quite a while. Some of the fastest supercomputers in the world are actually clusters of Linux boxes, though most of those use Alpha chips.

Trent McDonald
Nashua, N.H.

FOLLOW THE LEADER

I would like to commend William Cohen on his column "Eight universal laws for becoming a great leader" (Dec. 21, 1998, page 38). It is nice to see a real leader write this type of article rather than a theorist. Cohen's column not only helps people to become good leaders, but also serves as a checklist that helps people currently in leadership positions assess their own leadership abilities.

Rodney Horton
Network administrator
18th Judicial District
Wichita, Kan.

COMFORT ZONE

Your editorial "Resolve not to be comfortable in 1999" (Jan. 11, page 30) brought to mind AT&T's response when I switched long-distance carriers. I got a phone call from the company a couple of weeks later offering me various incentives to switch back. My response was that during the 20-plus years that I had been a customer, not once did I get a call regarding how I could save money or even thanking me for being a customer.

AT&T needs to learn that it's cheaper to hold on to a customer you've already got than it is to get a new one. That is a lesson that many companies have to relearn constantly, as your editorial pointed out.

Dave Zamzow
Technologist
Allard & Associates
Fort Collins, Colo.

Send letters to nwnews@nww.com or John Gallant, editor in chief, Network World, *161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.*

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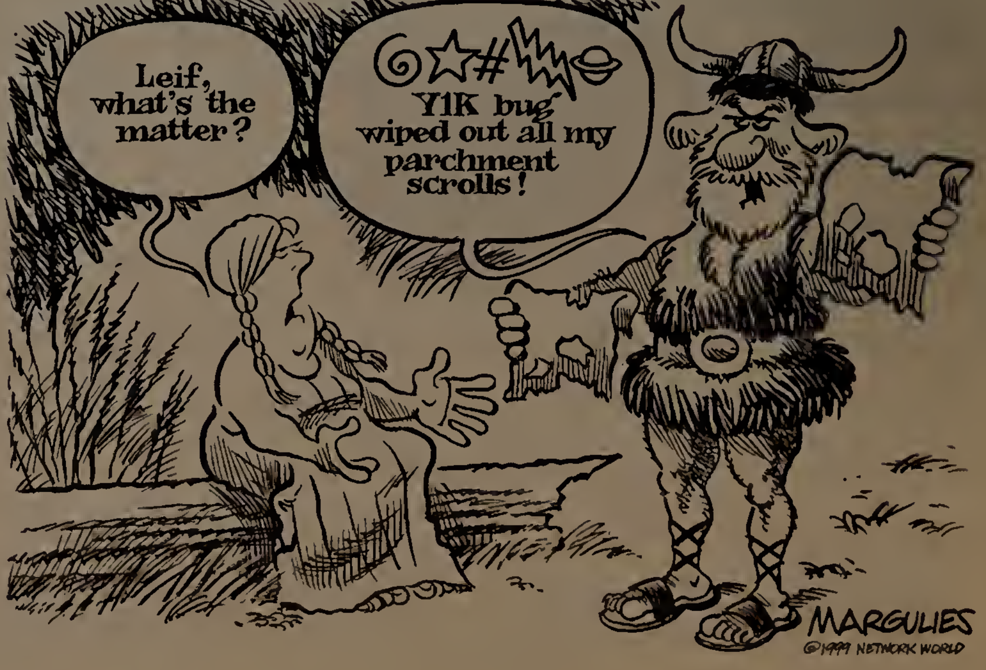
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Intranet Advisor . Daniel Blum

GET READY: MANAGEABLE PKI IS COMING SOON

The busy exhibit floors and crowded press room at last month's RSA Data Security Conference were proof of heightened industry interest in — and spending on — public-key infrastructure (PKI). Today, public-key encryption and digital signature security capabilities are mostly browser-based, with user keys and certificate authority keys embedded in the browsers' executable files. Procedures that enable e-commerce partners to exchange certificates are not user-friendly and are fraught with interoperability problems.

Before users can heavily deploy public-key capabilities in production environments, they will need a more manageable PKI — one that takes today's proliferating browser-based public-key security capabilities and adapts them to a more scalable model (see related story, page 34). A number of announcements at the RSA conference signify that this transition is beginning.

For example, directory innovator Netscape announced its Netscape Directory for Secure E-Commerce and the Netscape Meta-Directory offerings. The directory tightly integrates Netscape Directory Server 4.0 with Netscape Certificate Server 4.0 so administrators can generate a certificate when a user is added to the directory or revoke a certificate when the user is deleted. Meta-Directory provides object merging and attributes update services that enable Netscape Directory to coexist with corporate directories, extranet directories or customer databases.

Meanwhile, PKI leader Entrust Technologies announced it is spearheading the formation of a trust network, called Entrust Worldwide, that will link e-commerce communities with common policies. With Entrust Worldwide, users in one company will be able to exchange encrypted information with another company and automatically authenticate users from that company.

Finally, IBM announced an integrated directory and security product centered around its IBM eNetwork LDAP Directory Services and partner-provided tools, such as Allot Communications' Policy Manager. Policy Manager pushes policies from the directory into firewall, single sign-on and certificate authority components.

With these and many other products hitting the streets, the transition to managed PKI should be well-advanced within a year or two. In the meantime, develop a PKI policy that covers major secured applications and begin using or piloting key applications, such as virtual private networks, secure e-mail, secure Web authentication and desktop file encryption. Give enterprise directory programs the highest priority because fully deployed PKI requires a unified enterprise repository to register the identity of all PKI-enabled users.

The wheels of industry are turning. PKI may not be ready for prime time, but it's not too early to get ready for PKI.

Blum is a senior vice president and principal consultant with The Burton Group, an IT advisory service providing in-depth analysis for network planners. He can be reached at dblum@tbg.com.

On Security . Winn Schwartau

DARE TO DISCONNECT: A FRESH APPROACH FOR FIXING YEAR 2000

The anticipated real-world problems associated with Y2K are a lot more complex than a single company collapsing for lack of Y2K compliance. Even if Bank A is fully Y2K-compliant, its operations do not exist in isolation. Bank A must interoperate with Bank B in Hong Kong, Bank C in London and so on; such is the nature of the global economy.

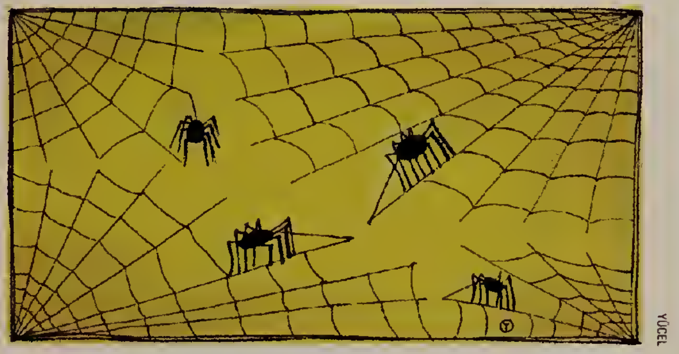
The real problem with Y2K is the Cascade Effect — one company's Y2K problems flowing downstream into other companies' nets.

I have met a couple of executives from major financial and industrial firms who have seriously considered the Cascade Effect and how to deal with it. But in general, the prevailing attitude seems to be, "We'll do everything we can reasonably do, and hopefully, have less of a mess to clean up than if we did nothing." This approach is litigation waiting to happen.

I suggest that there is a much more sane and common-sense approach than waiting for disaster to arrive: I advocate Graceful Degradation when it comes to Y2K.

Twenty or so years ago, we probably could have given up our primitive fax machines and word processors with negligible impact on our businesses. In fact, many of us could have easily reverted to pencil-and-paper alternatives to technology. That is a Graceful Degradation from one business process to another.

Today, business is conducted on a network of networks. The Cascade Effect occurs when failure hits one network and the errors compound as they travel from network to network. The AT&T outages are but a few examples of the Cascade Effect that have occurred over the past decade. Now with Y2K, we face the ultimate network-of-networks failure.



Graceful Degradation does not have to mean resorting to yellow pads and No. 2 pencils. Today, it could mean something as simple — and survivable — as isolating networks from one another and seeing what happens.

I suggest that we redefine network survivability in the face of Y2K to mean, "a network that can correctly operate in isolation from the networks with which it normally interacts." First, you have to identify the departmental networks that absolutely have to be part of your corporate network. For example, if you disconnect the human resources or finance department networks from the corporate network, how much disruption will occur to your business processes? This is Graceful Degradation; mitigating the possibility of far greater damage by disconnecting networks that could be subject to the Cascade Effect.

Politically, disconnecting your networks from one another may be unpopular, but it certainly provides a solution for surviving Y2K. To determine whether your organization is a candidate for Graceful Degradation, answer the following questions:

- Are you absolutely positive that none of your business partners or networked associates can trigger a downstream Y2K failure in your systems?
- Are your absolutely certain that your network is Y2K-compliant and cannot accidentally infect those of other organizations?
- Have you tried to disconnect your extranets in order to measure the impact on your business?
- Is the impact of disconnecting those networks in a controlled manner any worse or better than if they failed without your management?
- Have you looked into how to conduct business with your partners without being networked to them?
- Within your company, have you tried to isolate departmental networks from one another to measure the ramifications on internal business processes?
- Have you developed a business policy to deal with reduced network functionality for a prolonged period of time?
- Do you have a corporate plan that parallels your disaster recovery and operations contingency plan?

I don't know much about Y2K coding, but I do know that if we don't test and mitigate the ramifications of the Cascade Effect now, things will be a hell of a lot worse than if we do. Graceful Degradation is one approach.

Schwartau is president of InfoWar.Com and chief operating officer of The Security Experts, an information security consulting firm in Seminole, Fla. He can be reached at winn@securityexperts.com or winn@infowar.com.

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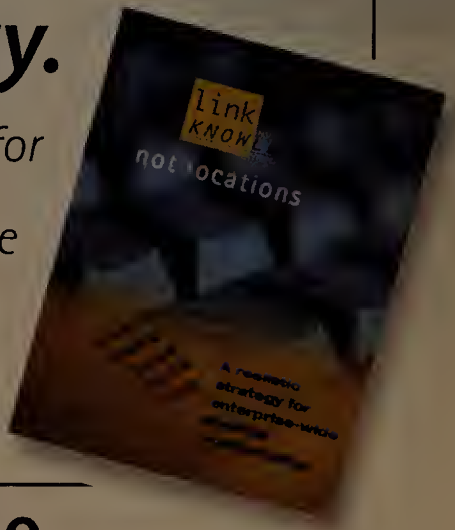

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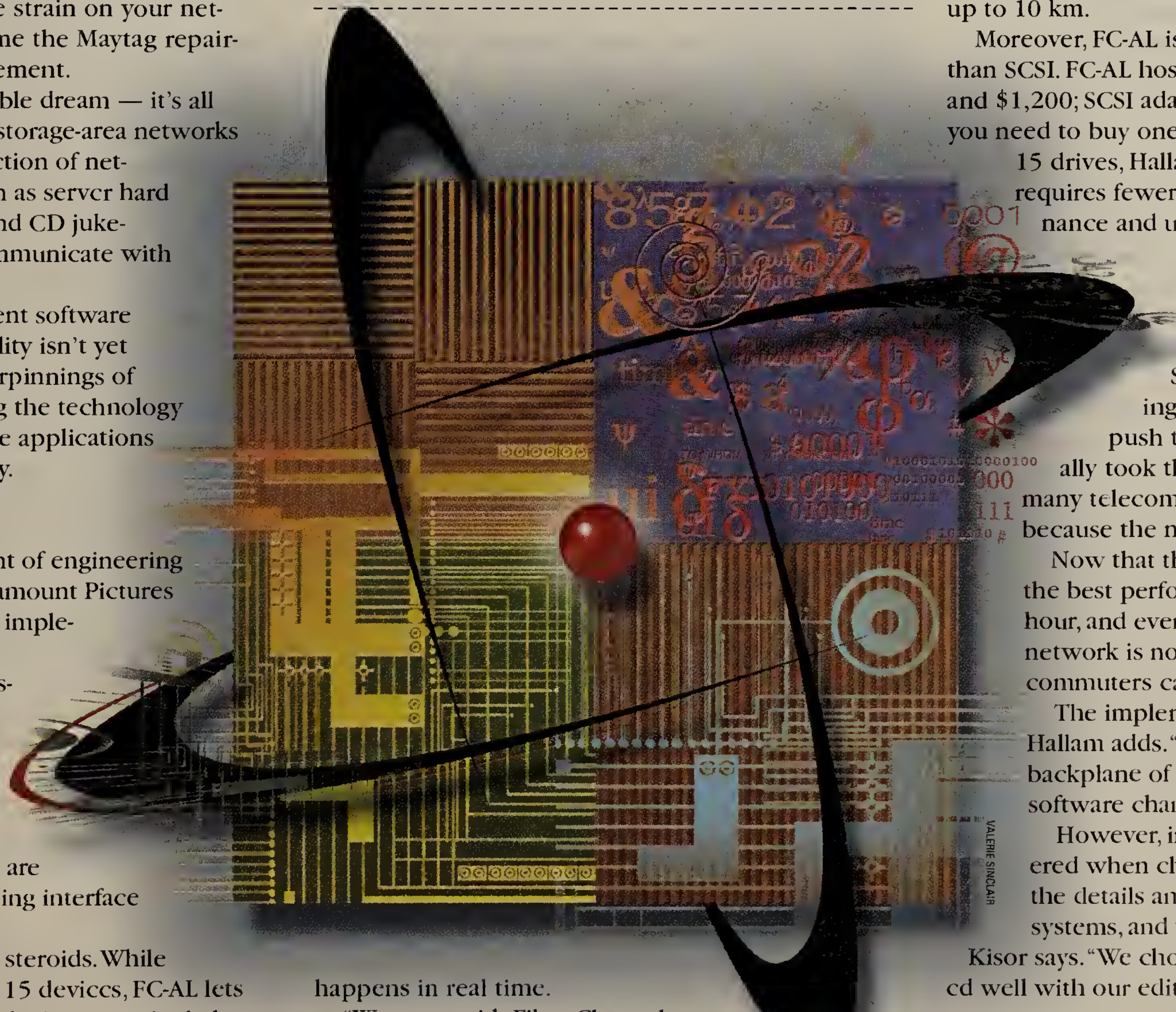
UNREALIZED POTENTIAL

BY RIVKA TADJER

Storage-area networks hold great promise, but the lack of automation software stands in the way of deployment.


VALERIE SINCLAIR

Imagine if all your storage devices were attached to a switch and could communicate with each other. And imagine all storage administration and management was totally automated. With no need to guide storage and retrieval traffic, manage backups or worry about the performance strain on your network, you could become the Maytag repairman of storage management.

This isn't an impossible dream — it's all part of the promise of storage-area networks (SAN). A SAN is a collection of networked storage devices, such as server hard drives, tape libraries, RAID and CD jukeboxes, which are able to communicate with each other automatically.

The automated management software required to make SANs a reality isn't yet available. However, the underpinnings of SANs are maturing, providing the technology for some useful, cost-effective applications that you can start using today.

FC-AL: A first step

Robert Kisor, vice president of engineering and technical services at Paramount Pictures in Hollywood, Calif., recently implemented the Fibre Channel-Arbitrated Loop (FC-AL) transport protocol as the company's first step toward a SAN. FC-AL supports 200M bit/sec throughput, dual-port channels and hot-pluggable drives. Storage vendors are positioning FC-AL as the leading interface for SANs.

Think of FC-AL as SCSI on steroids. While SCSI can only connect up to 15 devices, FC-AL lets you connect as many as 125 devices to a single host adapter. And while SCSI requires hundreds of wires to attach devices, FC-AL's loop architecture lets you use one cable to create a loop among the attached devices.

Paramount has eight high-end servers and scores of workstations on a FC-AL loop that's used to transfer video for the TV show *Entertainment Tonight*. The ample throughput allows editors to send video to the production crew for live news feeds and makes the editing process much faster, Kisor says. It used to take a few minutes to pull up video; now it happens in real time.

"We went with Fibre Channel because we had a 15-year-old video editing system in place that was totally inefficient and obsolete," Kisor says. "When I researched the options, FC-AL was easiest to implement and integrate with our existing editing software and production systems."

Ken Hallam, director of technology for storage systems engineering at Unisys in Mission Viejo, Calif., says FC-AL is attractive because it's a dual-port technology, just like SCSI. This means a server can simultaneously send and retrieve documents to the same tape drive with no waiting.

FC-AL is also built for distance, which is useful in an environment such as Unisys' in which tape libraries are scattered throughout the building. "I don't need to buy repeaters to cover the distance down the hall to our tape library room like I do with SCSI," Hallam says. While SCSI only allows a 25-meter stretch between machines, FC-AL supports spans of up to 10 km.

Moreover, FC-AL is less expensive to implement than SCSI. FC-AL host adapters cost between $700 and $1,200; SCSI adapters only cost about $150, but you need to buy one SCSI adapter for every seven to 15 drives, Hallam says. And because FC-AL requires fewer adapters, there's less maintenance and upkeep.

Hallam has been working with FC-AL for about two years, and says one of the most striking differences between it and SCSI is network availability during daily backups. Backups used to push the network to its limit and usually took the entire night. During a backup, many telecommuters were unable to log on because the network was so bogged down.

Now that the SAN routes backup traffic for the best performance, "It takes about one hour, and even during that hour, accessing the network is no problem," Hallam says. "Telecommuters can be a lot more productive."

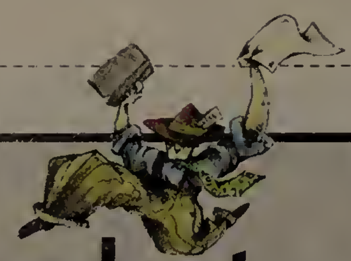
The implementation itself was a no-brainer, Hallam adds. "Everything gets wired into the backplane of the circuit board with very few software changes."

However, interoperability must be considered when choosing a SAN. "Pay attention to the details and compatibility with existing systems, and you won't have much trouble," Kisor says. "We chose Tektronix because it integrated well with our editing software."

SAN setbacks

Although companies such as Paramount and Unisys are already reaping the benefits of FC-AL, it will be some time before they'll be able to fully realize the benefit of SANs. Several limitations of Fibre Channel technology are holding back the development of automated SANs.

Instead of relying on the loop architecture, full Fibre Channel implementations use switches to route traffic — this requires a major software overhaul. Two years into Unisys' deployment, "We're still working on

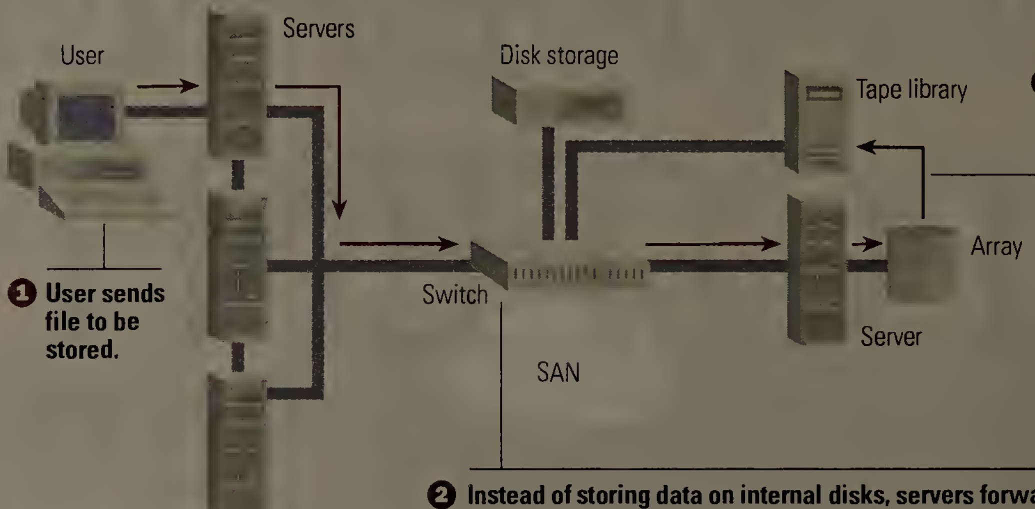


The Upshot

The Fibre Channel underpinnings of SANs are coming along, but don't count on deploying a true SAN anytime soon. The lack of automated management software, drivers and Windows NT compatibility are big shortcomings that first need to be addressed.

SAN structure

A storage-area network provides centralized management of storage devices from anywhere on the network. The idea is to untie storage tasks from specific servers and enable a shared storage facility that uses high-speed network technologies as a backbone.



❶ User sends file to be stored.

❷ Instead of storing data on internal disks, servers forward the file onto the SAN, where network devices, such as switches, direct the file to the appropriate storage device.

❸ File is stored on the device with the most space. These files can be automatically forwarded to other storage facilities for data mirroring, disaster recovery or backup applications.

SOURCE BROCADE, SAN JOSE

rewriting the software code in order to make switching work," Hallam says. "It's expensive and laborious and requires a lot of expertise."

The key problem Unisys has encountered is with the drivers. "There are big software changes as soon as you start spreading out availability of different storage devices," he says, noting that a switched network might include as many as 16 million disk drives. Hallam's engineers are working closely with Unisys' primary Fibre Channel vendor, Seagate, to share the programming work. He expects to finish later this year.

Moreover, while Fibre Channel provides more centralized management, servers don't automatically route data where it belongs. The instructions must still come from the multiple host adapters, and the management software to automate those instructions needs to be improved.

"I'm keeping an eye on management software and watching as it evolves," Hallam says. "There still has to be an administrator monitoring our network. I hope to achieve full automation at some point, maybe within a few years."

Kisor has made no move to fully switched Fibre Channel yet, and probably won't until the automated management is worked out.

Tom Lahive, senior storage systems analyst at market researcher Dataquest in San Jose, says interoperability, reliable chip sets and compatibility with Windows NT are other thorny issues that need to be addressed before switched Fibre Channel is ready for prime time. "One vendor's device doesn't necessarily work with another's, and you can't ignore incompatibility with a platform like NT," he says. Today's SANs support Unix.

Not surprisingly, vendors are singing a slightly different tune. Most host bus manufacturers are developing the enabling drivers for Fibre Channel-ready switches, says Peter Tarrant, vice president of marketing and systems development for Fibre Channel switch manufacturer Brocade in San Jose.

Tarrant says NT compatibility will exist soon, and companies such as Compaq and StorageTek are integrating drivers into Fibre Channel network devices such as hubs and switches.

Even though the driver issue isn't solved, Tarrant argues that switched Fibre Channel is so superior to FC-AL that it's worth the implementation hassles. "The real issue of switches versus the hub loop is that the loop is not reliable. When the loop fails, the whole thing goes down," he says. "With the switch approach, there is fault tolerance."

However, Hallam points out that hot-pluggable drives allow administrators to replace a failed drive without bringing the whole looped network down.

Besides, vendors such as Ancor, Brocade and Vixel are pricing their Fibre Channel switches at $17,000 and up. When you're spending that kind of money, the programming costs associated with switched Fibre Channel won't look so expensive.

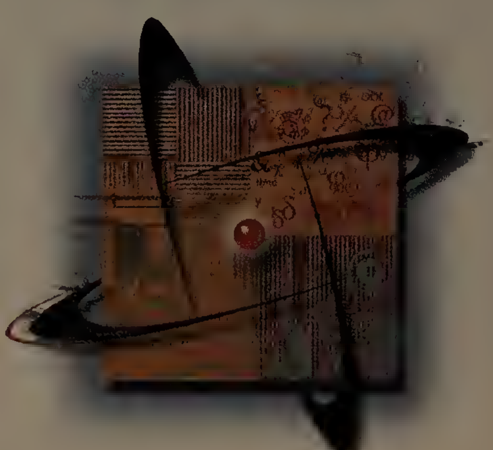
"Nothing is easy, and Fibre Channel is no exception," says Nick Allen, vice president and research director of Gartner Group in Stamford, Conn. "It is, however, a viable mechanism, and despite its glitches, it's the only candidate out there."

Companies with extensive testing capabilities have the best chance of success with Fibre Channel switching rollouts. If you're thinking of becoming an early adopter, consider buying all your Fibre Channel products from the same vendor because the technology is hard to debug and troubleshoot. "People tend to forget that new technologies just take time to work themselves out," Allen says.

Until then, the expense and labor associated with true SANs will go with the territory of being an early adopter.

Tadjer is a freelance writer in New York. She can be reached at rivkat@mindspring.com.

SORTING OUT STORAGE



Storage-area networks (SAN) are fast becoming part of the IT lexicon, but the abundance of other storage management acronyms is making things a bit confusing.

A SAN is a collection of networked storage devices that can automatically communicate with each other. It's important to note that a SAN doesn't have to use Fibre Channel as its underpinnings, according to Tom Lahive, senior storage systems analyst at market researcher Dataquest in San Jose. For example, the mainframe environment's Enterprise Systems Connection channels could form the SAN interface.

"The key to understanding what makes a SAN is understanding that the goal is to divorce all users and network administrators from storage management," Lahive says. "Storage, retrieval and file transfers are automatically managed in a true SAN."

OK, so what is network-attached storage (NAS)? SANs may include NAS-enabled devices, but they aren't the same thing.

A NAS system is connected to application servers via the network. But unlike a SAN, with NAS, users can directly access stored data without server intervention, Lahive says. A SAN will automate management of storage systems, while NAS devices don't have this capability.

And when it comes to automated management in a SAN, there's yet another definition floating around: hierarchical storage management (HSM). "HSM is simply managing data movement from online to offline storage, such as to tape devices," Lahive says.

— *Rivka Tadjer*

More Online

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DocFinder 1321

- A comprehensive collection of SAN resources, including white papers, a Fibre Channel overview, frequently asked questions and previous articles
- A forum where you can share your thoughts about SANs

E-COMMERCE TO GO

Want to build your own Internet store? Consider Microsoft Site Server 3.0 Commerce Edition, a standout in our tests.

BY CHRISTOPHER NULL

If you've got something to sell on the World Wide Web, there are plenty of service providers vying to host your e-commerce site. But large companies with the in-house resources to maintain their product catalogs online can probably do a better job themselves with one of the five electronic storefront packages we tested.

Despite the enormous price range of these products — from $495 to $19,999 — we were surprised to find that many vendors are missing critical components, such as enterprise scalability and interoperability. Most still haven't realized that e-commerce needs to focus on the buyer, not the seller. For example, Internet shoppers want quick, intuitive shops with helpful recommendation features and easy payment options. Few packages offer any of these features, much less all three.

Our Blue Ribbon Award winner is Microsoft Site Server 3.0 Commerce Edition, a mammoth storefront builder and manager that can scale from simple shops to online malls. Site Server didn't win any points for its installation procedures, but the ease of management and sheer weight of features the system includes make it the hands-down winner.

Our other high-end product, IBM's Net.Commerce Pro 3.1.1, is tough to use and tied to proprietary back-end systems, though it's unmatched in its ability to import database information from legacy applications.

At the low end, Inex's Commerce Court 3.2 Professional stood out for its ease of use, good features and excellent value. For less than $1,000, Inex provides everything a small company needs for creating an online commercial presence. Two other low-end contenders, GoldPaint Internet Services' Shopping Cart Professional 3.945 and WebGenie Software's Shopping Cart Professional 2.03, offered fewer features and weaker third-party support.

Leader of the pack

It's easy to be skittish of a complex application, such as Microsoft Site Server 3.0 Commerce Edition, which comes on two CD-ROMs. But once we had it up and running, we found Site Server to be the best all-around e-commerce tool in this comparison.

Site Server is surprisingly easy to use and feature-rich. Microsoft includes five sample sites that demonstrate business-to-consumer and business-to-business storefronts. Site Server supports third-party payment processing and tax calculations for just about every service provider we know. For the power user, the Pipeline Editor helps you design the flow of commerce through your site on a step-by-step basis.

Additional features include an advertisement manager; a robust searching system; a push-based content system based on Microsoft's Active Channel; and in-depth reporting tools that provide complete details about your site and its sales. New in Version 3.0 is integration with Microsoft Transaction Server for server-centric application deployment.

Best, and most important, all the pieces of Site Server 3.0 Commerce Edition work well as part of a unified whole. And despite its vast scope, the system is quite speedy, allowing you to retrieve product information with no measurable waiting time.

However, don't harbor any illusions about easily interoperating Site Server with an Oracle database or a Netscape Web server. Site Server requires Microsoft's Internet Information Server (IIS) 4.0, Microsoft SQL Server 6.5 with Service Pack 4, and an NT File System volume on your hard disk upon which to install the software. You'll also need heavy SQL Server knowledge to properly configure the four databases you need to run all of Site Server's features. (Although you can use Oracle or any other Open Database Connectivity-compliant database, the implicit recommendation is that you use SQL Server.)

Plan, too, for a rough installation. Failed install scripts, crashed servers, command-line work and numerous lengthy setup routines sent us scrambling to Microsoft TechNet on more than one occasion.

For a hint of just how complex Site Server is, take a look at the "Getting Started" book, which is 131 pages. Microsoft's remaining manuals are good enough to get you on your way without many calls to tech support.

All in all, Site Server 3.0 Commerce Edition is a good value at almost $6,500 for unlimited user connections (and unlimited stores, so you can use this as a hosting product as well), and it's one of the best e-commerce tool kits out there.

A simple plan

While it came in as runner-up to Site Server on our Score Card, Inex's Commerce Court 3.2 Professional is a different order of magnitude in price ($995) and complexity. Easily the simplest tool we tested, Commerce Court is also one of the best electronic storefront programs you'll find if your e-commerce needs are limited.

Managing a catalog of products is easy. Each product is fully defined through a set of tabbed pages. You can import a catalog of items from a number of sources, including Intuit's QuickBooks or BestWare's M.Y.O.B. inventory records. Unfortunately, you cannot import a catalog of items from any mainstream databases except Microsoft Access. You can link directly

Product: Site Server 3.0 Commerce Edition

Vendor: Microsoft

Our Blue Ribbon Award winner is Microsoft Site Server 3.0 Commerce Edition. If you can work your way through the tricky installation, you'll find a wealth of features at a reasonable price.

NetworkWorld Blue Ribbon

Net Results

	Pros	Cons
Site Server 3.0 Commerce Edition **Microsoft** (800) 426-9400 www.microsoft.com/siteserver/commerce $3,499 for server; $49.99 per concurrent client license; $2,999 for unlimited clients	▲ Easy to use ▲ Comprehensive features ▲ Strong third-party support	▼ Rocky installation
Commerce Court 3.2 Professional **Inex Corp.** (888) 487-4639; www.inex.com/product/pro.asp $995	▲ Simple installation and management ▲ Strong third-party support	▼ Weak reporting
Net.Commerce Pro 3.1.1 **IBM** (800) 426-4968; www.software.ibm.com/commerce/net.commerce/ncver3.html#ncpro $19,999	▲ Imports database material ▲ Supports secure transaction protocols ▲ Incorporates multinational features	▼ Complicated installation and management ▼ Limited reporting
Shopping Cart Professional 3.945 **GoldPaint Internet Services** (909) 693-0458; www.goldpaint.com $1,495	▲ Inexpensive and simple	▼ Tricky installation ▼ Tiresome HTML extension approach ▼ Light on features
Shopping Cart Professional 2.03 **WebGenie Software** +61 8 8226 7382; www.webgenie.com/navbar.html $495	▲ Builds simple, straightforward storefronts	▼ Virtually nonexistent feature list

	Site Server 3.0 Commerce Edition Microsoft	Commerce Court 3.2 Professional Inex	Net.Commerce Pro 3.1.1 IBM	Shopping Cart Professional 3.945 GoldPaint Internet Services	Shopping Cart Professional 2.03 WebGenie Software
NATIVELY SUPPORTED DATABASES					
Microsoft SQL Server	Yes	Yes	No	Yes*	No
IBM DB2	No	No	Yes	No	No
Oracle	Yes	No	Yes	Yes*	No
Sybase	No	No	No	No	No
Microsoft Access	No	Yes	No	Yes*	No
Any ODBC	Yes	No	Yes	Yes*	No
SUPPORTED WEB SERVERS					
Microsoft IIS	Yes	Yes**	No	Yes	Yes
Netscape Enterprise Server	No	No	Yes**	Yes	Yes
SUPPORTED TRANSACTION SYSTEMS					
CyberCash	Yes	Yes	Yes*	Yes	Yes
ICVERIFY	Yes	Yes	No	Yes*	No
Microsoft Wallet	Yes	Yes	No	No	No
TAXWARE	Yes	No	No	No	No
PROMOTIONS					
Banner advertising	Yes	No	No	No	No
Discounts	Yes	Yes	Yes	No	No
Coupons	Yes	No	No	No	No
Cross-selling	Yes	Yes	Yes	No	No
Direct mail	Yes	No	No	No	No
Samples included	Yes	Yes	Yes	Yes	No

* Requires special setup routines not included in general distribution. ** Proprietary or third party Web server included.

to a Microsoft SQL Server back end to store pages or data, but you have to use Inex's Server Extensions add-on to do so, an unnecessary headache.

Commerce Court's streamlined graphical management interface is a plus. For example, setting up taxes is easier than with other storefront products, though Commerce Court's tax options are limited.

New in Version 3.2 is much-needed support for several payment gateways, including CyberCash. With these additions, Commerce Court's third-party support is unparalleled at this price.

Commerce Court includes a ton of sample store designs and templates. On the other hand, we found its report selection to be weak, consisting of only four simple reports focused on sales activity.

You can run Commerce Court as an add-on to Microsoft Site Server 3.0 or alone with Microsoft IIS 4.0. As an addition to Site Server, Commerce Court's value is limited.

Commerce Court is primarily designed to work with an ISP's e-commerce hosting service, but you can use it to set up shop on your own servers with a little extra work. Installing the system is simple after you change the settings to work with your local host. Documentation is fair but largely unnecessary.

Overall, Commerce Court is a great way for smaller shops to ease their way into e-commerce.

Reigning big shot

Thanks to a ubiquitous advertising campaign, IBM's Net.Commerce is one of the best-known electronic storefront packages in the industry. However, our testing of Net.Commerce Pro 3.1.1 suggests that IBM would be better served by putting money into enhancing its product rather than advertising.

While a product such as Microsoft Site Server is a tool kit, providing hooks into dozens of third-party applications, IBM's Net.Commerce Pro 3.1.1 represents the consummate do-it-yourself package with everything you need on a single CD-ROM. If you want external service connectivity to third-party products such as CyberCash, you can build that into the Net.Commerce system. But you have to build it yourself.

The software comes in four parts. For back-end functionality, you get IBM's DB2 Universal Database, although Oracle8 is also supported. For Web services, you get the Domino Go Webserver, or you can use the standard Domino Web server or Netscape's Enterprise Server. Also included is IBM's CommercePoint eTill for secure payment transaction services. And of course, there's Net.Commerce itself, the glue that holds it all together. To administer your Net.Commerce site, you must use Netscape Navigator 4.04 or higher.

We found Net.Commerce's performance to be fairly slow in comparison to the competition. Screens were sluggish to refresh; data was slow to load. The product also gets low marks for manageability. Unless you're a seasoned DB2 professional, the complexities of the database far outweigh those of any other component we worked with in this comparison.

If you have information in other databases, Net.Commerce provides tools to let you import it. IBM has built-in support for such legacy systems as SAP and MQSeries platforms, as well as various electronic data interchange systems. For users migrating from these high-end enterprise applications, Net.Commerce may be your only choice.

In contrast to managing a Net.Commerce site, building a store was a well-designed process. IBM has devised a simple process of selecting a business model (One Stop Shop, Personal Delivery or Business-to-Business), providing tax information, setting up shipping tables and selecting a look and feel for your store from templates.

Also to its credit, Net.Commerce is one of the few applications we've seen that makes full use of the Secure Electronic Transaction protocol for secure shopping. Net.Commerce also supports Secure Sockets Layer, which more sites are likely to use.

Multinational features, such as foreign currency translations, are well-executed. Sadly, though, reporting is limited to a handful of basic summaries. For the real deal, you'll have to dig into the reporting capabilities of DB2.

Installing Net.Commerce is a chore that can only be described as painful. It took us five tries, a complete rebuild of the operating system and a total of three days of working with the platform before we had any semblance of stability.

The installation difficulty is partly due to the complexity of the products and partly due to their bizarre installation requirements. For example, to run the install process, you have to log on as a user with administrative privileges, but the user's ID must be eight or fewer characters in length — meaning you can't use the Administrator account. Adding to the confusion, Net.Commerce gives you a slew of default accounts and passwords to remember, a different one for each of the four components of the commerce suite.

Net.Commerce comes with extensive documentation and, unfortunately, little of it is printed. With a product this complex, we think a vendor owes it to its customers to provide printed manuals.

In the final analysis, we were put off by IBM's behemoth of a commerce package and its enforced ties to complex proprietary back-end systems.

GoldPaint lacks luster

GoldPaint's Shopping Cart Professional 3.945 is a fair platform for building an electronic storefront, but those wanting advanced features or robust transaction processing will be disappointed.

Network World Blue Ribbon

ScoreCard	Manageability 25%	Features 25%	Performance 15%	Reporting 15%	Installation 10%	Documentation 10%	Total score
Site Server 3.0 Commerce Edition	8 x .25 = 2.00	10 x .25 = 2.50	10 x .15 = 1.50	9 x .15 = 1.35	3 x .10 = 0.30	7 x .10 = 0.70	8.35
Commerce Court 3.2 Professional	9 x .25 = 2.25	6 x .25 = 1.50	8 x .15 = 1.20	6 x .15 = 0.90	10 x .10 = 1.00	6 x .10 = 0.60	7.45
Net.Commerce Pro 3.1.1	5 x .25 = 1.25	9 x .25 = 2.25	6 x .15 = 0.90	5 x .15 = 0.75	2 x .10 = 0.20	6 x .10 = 0.60	5.95
GoldPaint Shopping Cart Professional 3.945	6 x .25 = 1.50	4 x .25 = 1.00	8 x .15 = 1.20	4 x .15 = 0.60	6 x .10 = 0.60	5 x .10 = 0.50	5.40
WebGenie Shopping Cart Professional 2.03	3 x .25 = 0.75	4 x .25 = 1.00	9 x .15 = 1.35	1 x .15 = 0.15	10 x .10 = 1.00	4 x .10 = 0.40	4.65

Individual category scores are based on a scale of 1 to 10. **Percentages** are the weight given each category in determining the **total score.**

IBM NETFINITY 5500 M10 SERVER: Up to 2-way Pentium® II Xeon™ processors (400 MHz) / Up to 2GB SDRAM ECC memory / Starting at $8,318*

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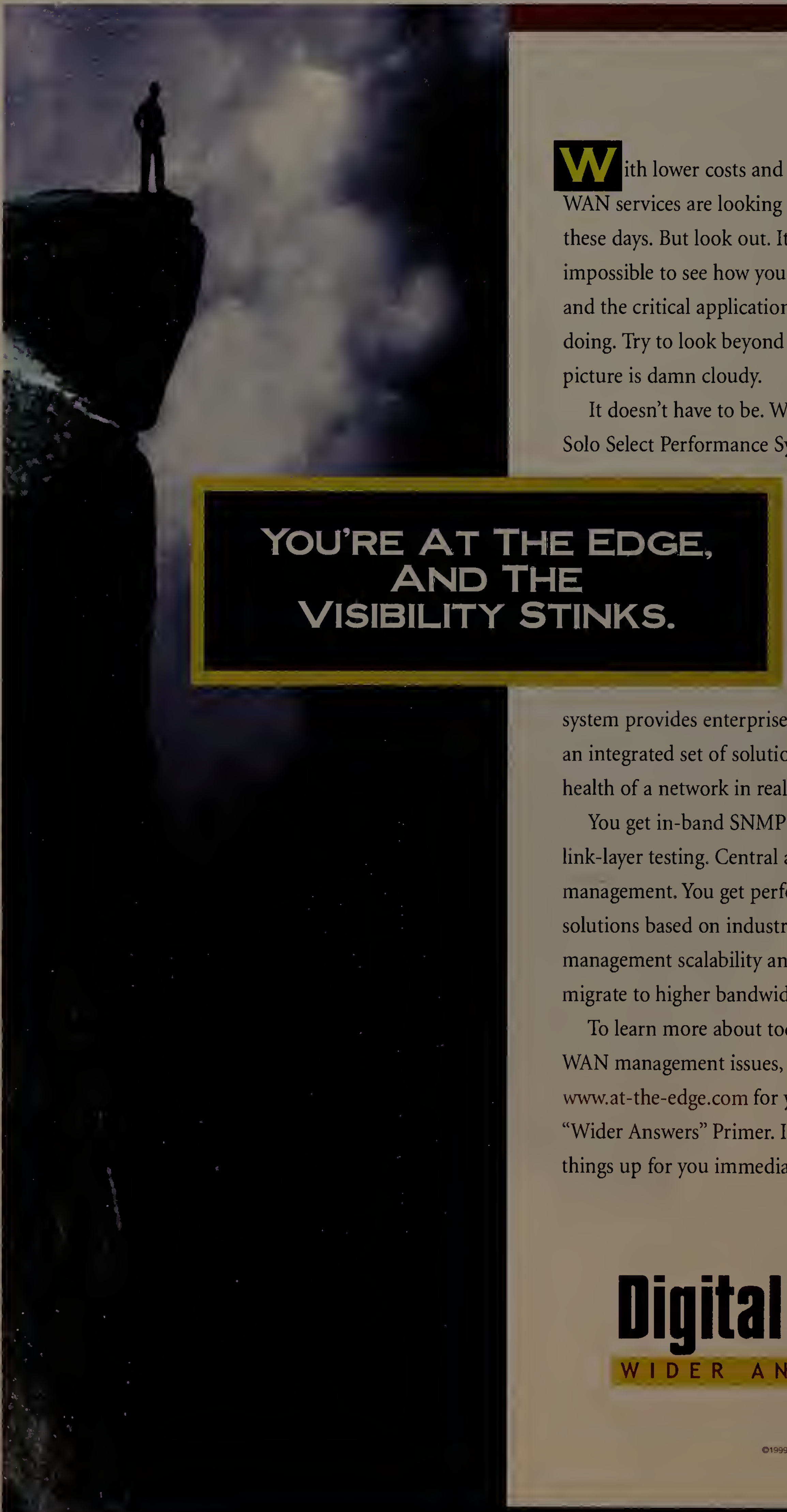
Everything in Shopping Cart Professional uses an HTML extension called Tag Activated Markup Enhancer (TAME), a Common Gateway Interface (CGI) program that you install on your Web server, which in turn serves up your storefront. Each HTML storefront function is built with a TAME tag that prefaces a command to define a product or a purchasing condition.

It's an interesting approach, but we'd rather not have to learn TAME and its HTML enhancements to work with our storefronts. TAME gets tiresome quickly, and it's not something that is likely to scale to larger organizations.

In general, Shopping Cart Professional's administration screens lack the intuitive approach that many of its competitors, such as Microsoft and Inex, have mastered. Shopping Cart Professional is light on features, such as discounts and cross-selling, and requires you to set up tax tables yourself. This version does support CyberCash, however.



With lower costs and higher performance, WAN services are looking mighty attractive these days. But look out. It's become nearly impossible to see how your many connections and the critical applications they enable are doing. Try to look beyond the LAN and the picture is damn cloudy.

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Product information databases are only supported if you export an ASCII flat file or extract your inventory information from an existing database. There is no native database support, unless you work with Shopping Cart Professional's custom programming services to build a do-it-yourself connection.

Shopping Cart Professional's reporting capabilities, limited to managing customer records and accounts, are unimpressive. The product's lack of polish is also evident in its tricky installation routine, which requires you to manually unzip some files and copy others into the proper directories. Documentation, all online, is fair but unmemorable.

At $990, GoldPaint's Shopping Cart Professional is one of a few inexpensive-and-simple e-commerce tools in this survey, but it certainly isn't the best of the lot. It can probably do the job, provided the job is not very sophisticated.

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- Our review of two e-commerce hosting products.
- How we did it.
- E-commerce resources.

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No whistles and bells

Clued in by its rock-bottom $495 price tag, we didn't have the highest expectations for WebGenie Software's Shopping Cart Professional 2.03. But for what the software is designed to do, it does a good job. WebGenie's Shopping Cart Professional builds simple, straightforward storefronts. The 320K-byte application comes on a single diskette, or you can download it from the Australian company's Web site.

By simply filling out a table of goods and prices, you can build a catalog of items in minutes. Shopping Cart Professional builds the requisite HTML code, JavaScript controls and CGI scripts for you. You link the resulting page to your existing site, and that's it.

A CyberCash interface is also available, but otherwise, the features list is nonexistent. There is no reporting, no database integration and no way to dynamically update your site. To update your site, you have to rebuild the CGI from scratch.

WebGenie's Shopping Cart Professional is a page-generator and nothing more. But it's a pretty nifty one and worth a look for do-it-yourselfers.

Null is the co-author of the upcoming Complete Networking Desk Reference *(Osborne). He can be reached at null@sirius.com.*

COMMAND PERFORMANCE

Lighten your PC administration load with ON Technology's ON Command Comprehensive Client Management 4.0.

BY RAWN SHAH

Administering network PCs is about as much fun as preparing your income taxes and equally unavoidable. Even with all the advances in operating system development, most desktop PCs still require hands-on configuration, installation and troubleshooting.

One way to reduce the hassle is with ON Technology's ON Command Comprehensive Client Management (CCM) 4.0 system. CCM lets you plug a computer into the network, and without leaving your seat, boot it, install an operating system, load software packages and customize the desktop properties. Once the PC is up and running, you can perform almost any task, including shutting down or rebooting the machines and redoing a partial install.

CCM works with any desktop, though existing stations are harder to integrate than new ones. Some older desktops and laptops will require a boot disk and manual intervention because of CCM's design.

CCM works primarily with Intel's Wired for Management (WFM) technology, which has been built into the BIOS of every major PC vendor's desktop system manufactured since mid-year 1998. WFM includes a Pre-OS Execution Environment (PXE), a mini operating system that allows you to administer hardware or load software without first installing a full operating system.

In turn, PCs with a PXE built into their BIOSes require network interface cards (NIC) that support PXEs. For older desktops, you can install a NIC that supports boot Programmable Read Only Memories (PROM) that contain a PXE. Alternatively, you can resort to a disk-based version of the boot software for older systems that don't support an appropriate NIC or PXE, and for laptops because PC Card-based NICs do not yet support PXEs.

There are three layers to the CCM structure: the client PC layer, the server layer and the administration layer. The client PC layer consists of a boot agent on the PROM, or a disk that has a simple BOOTP or Dynamic Host Configuration Protocol client to contact the server; a pre-OS agent; and a desktop configuration agent.

The server layer includes the CCM server and an API. The CCM server has three components: a configuration server, which keeps track of all client configurations; a software depot for installation profiles; and a repository server for client logs. The API lets different administration tools control the CCM server.

At the administration layer you'll find the CCM administration console, through which you perform all management tasks; the Enterprise Viewer, a snap-in for the Microsoft Management Console that allows you to view the status of all CCM-managed clients; and a command-line interface (CLI) tool that allows you to run any CCM command directly from a command window.

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- How we did it.
- Installation tips.
- ON CCM 4.0 product specs.

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In the field

We wanted to see CCM do three things: install NT 4.0 Workstation on a desktop, install Microsoft Office 95, and upgrade the system to Office 97. We also wanted to test CCM's InstallCam system, which records the installation of software so it can be duplicated on other desktops.

Using CCM, we loaded a DOS 7.0 (the DOS side of Windows 95) minisystem into a client PC's memory and ran it as a RAM disk. Once loaded, CCM installs a full TCP/IP stack and contacts the CCM server for further instructions. We told CCM to partition and format the 10G-byte disk.

After we prepared our clients, we used the CCM server to select the package to be installed, which included NT 4.0 Workstation and the CCM 4.0 client software. When we saved the configuration, CCM automatically initiated installation on the remote client. After about 20 minutes, we had a full NT client sitting at the logon prompt.

When we began installing Microsoft Office 95, we discovered that the CCM depot did not include a profile for Office 95. This gave us our chance to test the installation recording system.

We started InstallCam, pressed the record button, and launched the Office 95 setup program. When we completed the installation, we uninstalled Office 95 and, as a test, attempted to run the automated installation based on the profile we just created. At one point, InstallCam became confused between two similar dialog boxes. After a few minutes, ON's technical support staff was able to talk us through the process of debugging the InstallCam script, and we were able to run the installation profile without incident.

Finally, we upgraded Office 95 to Office 97. First we had to record the uninstallation process for Office 95. The Office 97 profile was available on our server, so we didn't have to record this installation process. We made one change to the Office 97 profile: We asked CCM to see if a previous version of Office was installed, and if so, to remove that version before installing the new one.

To see if everything would go through smoothly, we wiped out the entire system and told the CCM server software to reinstall the operating system, install Office 95 and upgrade to Office 97. The reinstallation ran without a hitch. We then successfully ran the entire scenario on three clients.

Once a PC is managed by CCM, any changes to its local configuration are saved on the CCM server and automatically restored if the desktop fails. If a desktop problem requires personal attention, an administrator can temporarily lock out a user and take control of the system remotely rather than trying to diagnose problems over the phone.

When it comes to tracking which clients have what software, ON Technology could do a little more to spruce up CCM, which has a built in database system but is not yet integrated with Microsoft's Open Database Connectivity protocol or Oracle Call Interface. Instead, all importing or exporting is done through text files.

CCM makes the most sense in networks of 500 or more client desktops, at which point ON Technology drops its price from $200 to $145 per seat. It's still not inexpensive, but the money you'll save in support costs may end up paying for the package and installation within a year or two.

Shah is a freelance writer based in Tucson, Ariz. He can be reached at rawn@rtd.com.

Net Results

ON Command Comprehensive Client Management 4.0

ON Technology
(617) 374-1400; www.on.com/prodinfo/cm.htm
$200 per seat for 1 to 499 seats; $145 per seat for over 500 seats

Pros

- ▲ Installs entire operating system and software packages remotely.
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- ▼ Some systems and laptops may require a boot floppy and manual installation.

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Individual category scores are based on a scale of 1 to 10. **Percentages** are the weight given each category in determining the **total score.**

The numbers game

How to make the annual budgeting chore less burdensome.

BY LAUREN GIBBONS PAUL

Peter Alissandratos has some harsh words for network managers who might be looking for a silver bullet to ease the pain of the annual budgeting process: Forget about it. There are no short cuts — it takes plenty of hard work and some good old-fashioned common sense.

"Once a quarter, you have to go back and review your projections to see if you met them. Don't just scramble and try to do some numbers at the end of the year," says Alissandratos, vice president of telecommunications at Chase Manhattan in New York. With 12 years of budgeting experience, he knows what he's talking about.

If, like most of the world, you're caught in catch-up mode, resolve to make this the year you get a handle on the budgeting process. Follow these principles, and you'll be able to tackle next year's budget with some numbers that reflect reality.

Gather your ammunition

Although paper and pencil would theoretically suffice, the vast majority of network managers work out their piece of the budget using a spreadsheet. More robust budget management tools such as PowerPlan Corp.'s PowerPlan software are fairly new and are typically used only by financial managers at the largest companies.

However, Richard Hu, president of PowerPlan in Huntington Beach, Calif., believes that will change as more companies look for ways to trim days off the budgeting cycle, which lasts from three to five months at the typical mid-size to large company.

"The tool saves weeks out of the budgeting process. And users no longer need to program links to hundreds of spreadsheets," he says.

Before you can figure out how much money you'll need for maintenance or replacement costs, you need to inventory your equipment to determine exactly what you have. Make note of serial numbers, dates of purchase, warranty or leasing information and maintenance data, says Paul Feener, a senior vice president at Alpine Computer Systems, a systems integrator in Holliston, Mass. Prior to joining Alpine in 1998, Feener was in charge of a $21 million budget as director of network services at a large New England utility.

"A lot of senior managers think that buying network equipment is like buying furniture — they don't think they'll ever have to replace anything," Feener says. For example, you need to be able to clearly spell out the effects of not replacing an aging server population.

Get some input

Along with performing inventory, solicit guidelines from management. Have a short chat with your boss to ensure you're on the same page in terms of how often various network components should be replaced, and plan your forecasts accordingly.

Likewise, you'll need input from your users about their expectations. Basically, this comes down to how much money departments are willing to spend on IT services.

Whether you formally tie the budget to a service-level agreement (SLA) is another matter. Alissandratos thinks this would unnecessarily complicate budgeting.

"We don't have to get crazy with the idea of putting SLAs around everything — it's too much paperwork. We should just say, 'You want me to deliver the following services, and to do that, I'll need this amount of money,' " he says.

SHAWN HENRY

Paul Feener, senior vice president at Alpine Computer Systems, assembled and managed a $21 million network budget for his former employer.

Another key component to the budgeting process is keeping abreast of developments in your industry and the network industry in general, Alissandratos says. For example, the volatility of the telecommunications industry means you can frequently shop around for better rates.

To pad or not to pad

A perennial budgeting question is whether to cover yourself by adding an extra amount — say 15% to 25% of the total — to hedge against budget cuts.

"For anything that's not an exact number, put another 25% on top of it. It keeps you safe," Feener says. His $21 million network budget for the utility initially included a cushion of about $2 million. "I knew I would end up at a good place after the chief information officer did his trimming."

Alissandratos, on the other hand, is a firm believer in using realistic figures.

"Padding is a game for children," he says. "My number is the real number."

If you come up with practical figures, you can better defend your projections when budget-cutting time arrives. If management insists on cutting the budget, you need to demonstrate the limitations and risks that the arbitrarily lower budget will produce.

Over time, management will come to trust your numbers. And once that happens, you'll know you have tamed the budgeting beast.

Paul is a freelance writer in Belmont, Mass. She can be reached at laurenpaul@sprintmail.com.

Survey says...

Budget management software vendor PowerPlan's survey of 50 financial managers from mid-size to large companies reveals the agony of the budgeting process.

- Budgeting cycles typically last three to four months.
- It takes three to five iterations before budgets are finalized.
- 78% of respondents hope to upgrade their current budgeting software within the next three years.
- All respondents described budgeting as problematic; not one described it as "perfect as is."
- The three most-used descriptions chosen were: too time-consuming, painful and cumbersome.

SOURCE: POWERPLAN, HUNTINGTON BEACH, CALIF.

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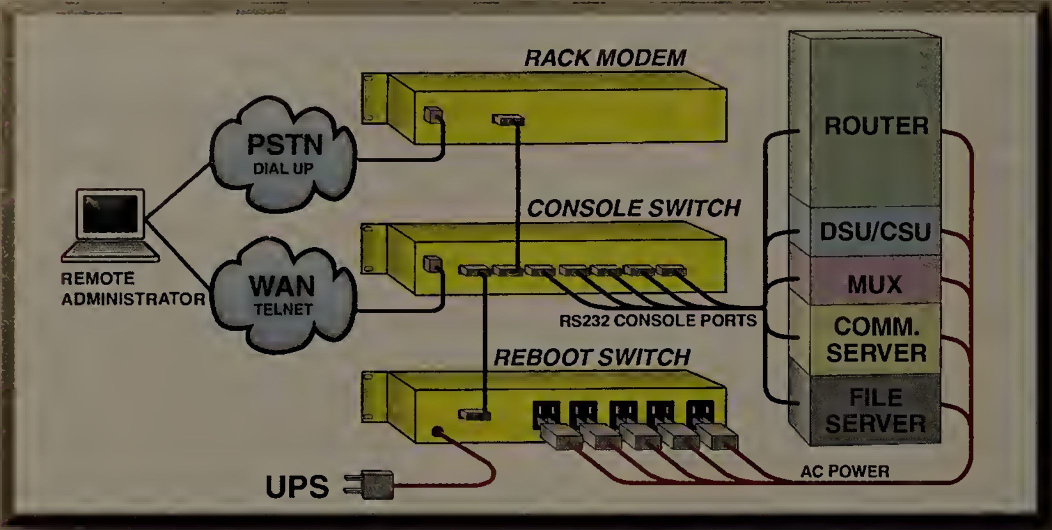

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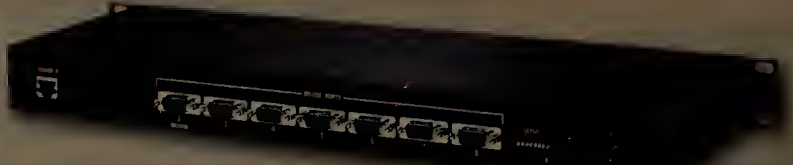

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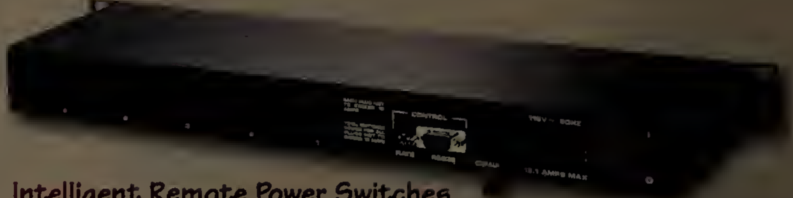

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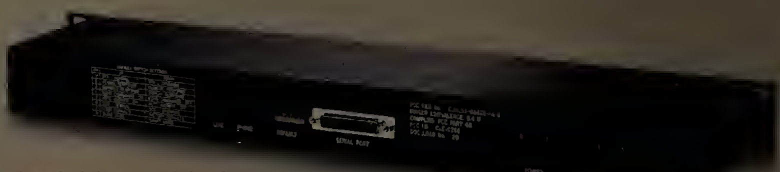

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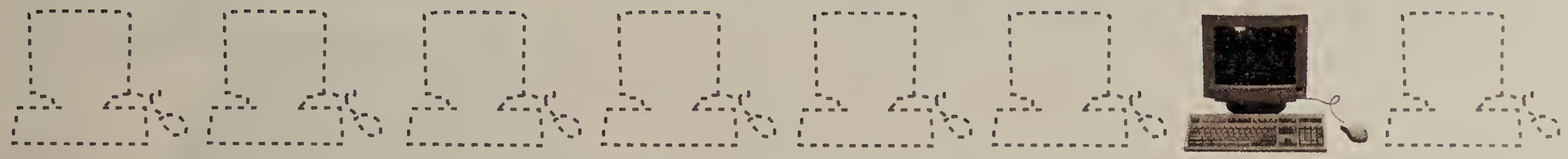

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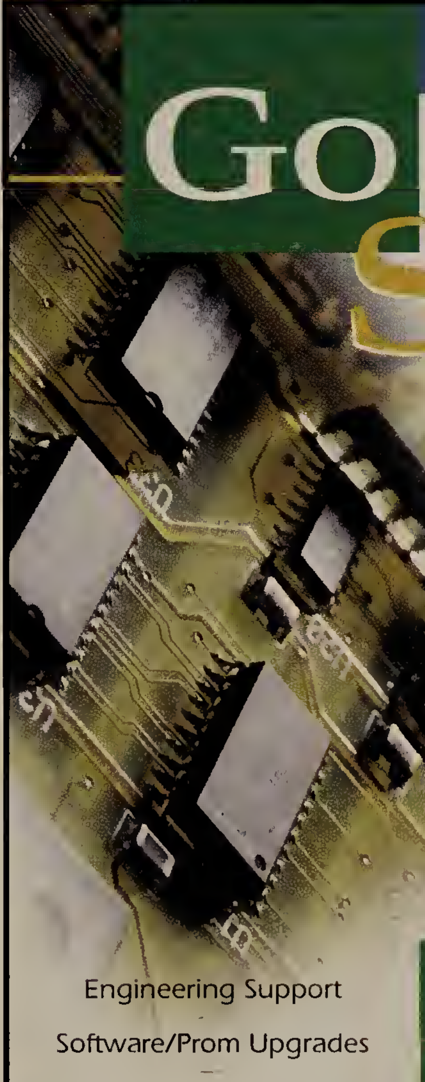

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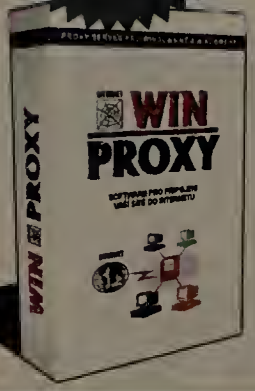

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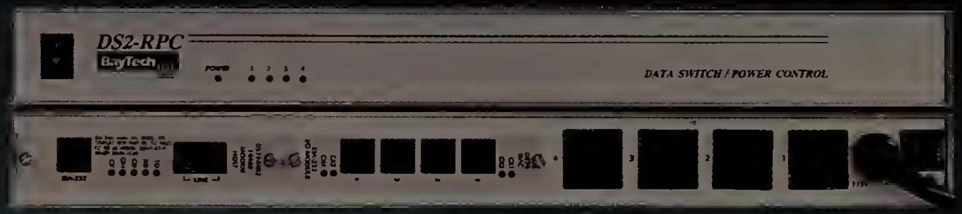

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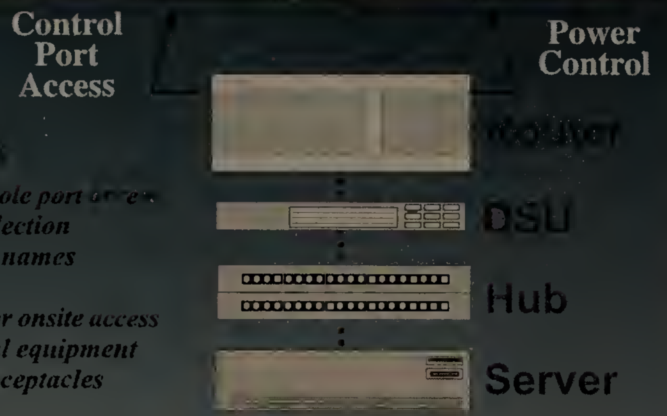

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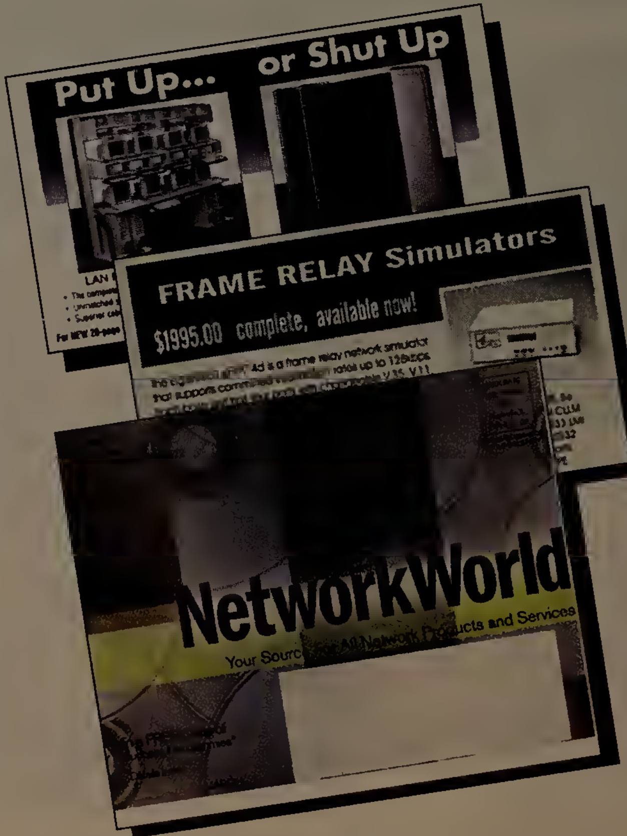
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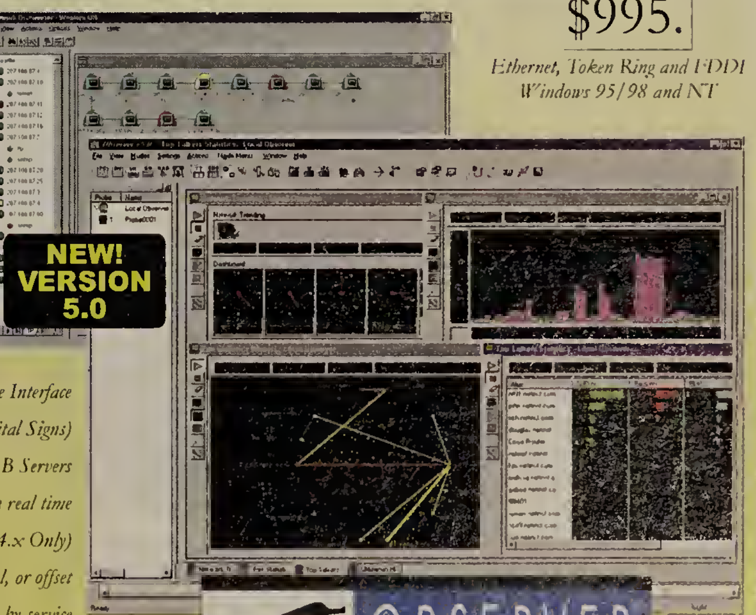

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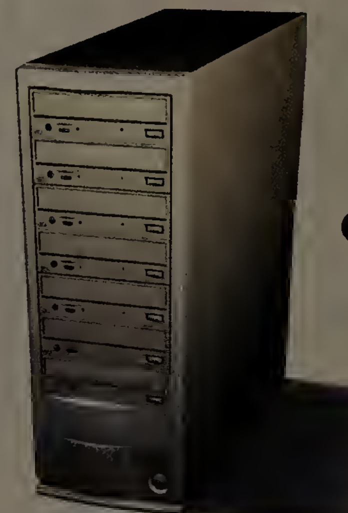

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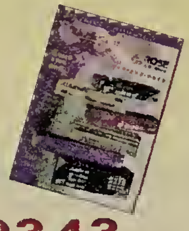

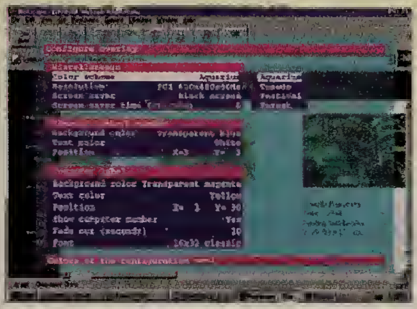

On-screen display menu–This screen shows the overlay menu with the selection for the color scheme popped up.

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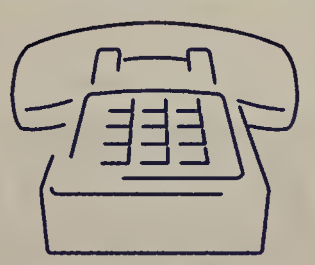

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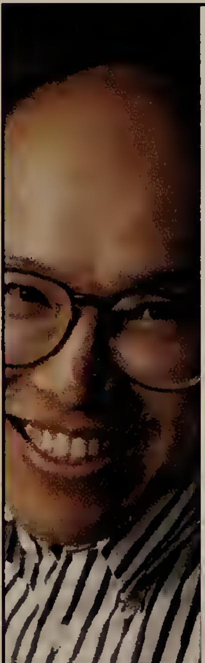

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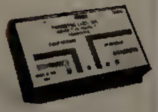

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3ware 17
A
Alcatel 8
Ameritech 1,25
AT&T 1,8,25
B
Bell Atlantic 1
C
Cisco 1,8
Compaq 6
C-Port 36
Crag Technologies 17
D
DataCore Software 17
G
GoldPaint Internet Services 41
GTE 1
GTE Internetworking 25
I
IBM 41
Inex 41
Infonet 8
Intel 1,58
Intermedia 8
IntraSoft 29
Inverse 15
Ipswitch 29
L
Level 3 Communications 25
Lotus 29
M
Marimba 29
MCI WorldCom 6,8,10
Medusa Labs 18
Microsoft 12,41
N
Net Networks 6
Netscape 6
Newbridge Networks 20
Nokia 17
Nortel 8
O
ON Technology 45
P
Pandesic 29
Plaintree Systems 17
Q
Qwest 8
R
Rhythms 10
S
SBC Communications 1,25
Sequent 8
Softway Systems 18
Sprint 8
Sun 17
T
Tangent Computer 17
Troika Networks 18
U
US WEST 8
W
WebGenie Software 41

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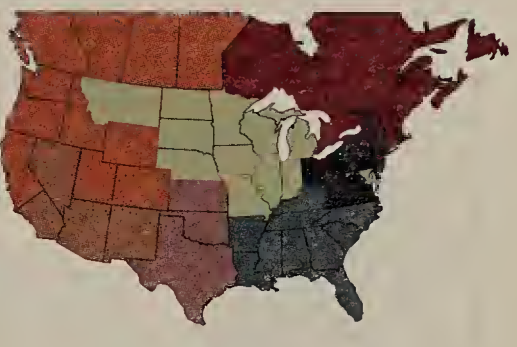

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ComNet,
continued from page 1

hundreds.

"It's time to write off those circuit-switched networks and PBXs and move along," said Chambers, who included a voice-over-IP telephone demonstration as part of his keynote presentation.

With the fervor of an evangelist, Chambers urged the crowd to act fast. "If you fall six months behind, even if you're a large company, you're going to lose," he said.

AT&T CEO C. Michael Armstrong spoke on a similar theme during his keynote address, emphasizing his point by announcing the carrier's Integrated Network Connect service for blending voice, video and Internet data onto the same access pipes (see related story, page 14).

"We're going from a circuit-switched world to a packet-switched world," said Armstrong, whose company's name is practically synonymous with circuit switching.

On the show floor, the 50,000 attendees heard voice over IP — literally. Vendors, such as Hypercom Network Systems, dotted the show floor with phone booths that attendees could step into to test the quality of IP voice.

Gian Zoppo, IS director for The Designory, a brochure maker in Long Beach, Calif., said he's all for putting voice onto his company's IP network once the company establishes the proper connections between its voice and Layer 3 switches.

"We see it as a big advantage because we won't have to pay what we're currently paying to talk within the organization, and if it works well, we'll probably deploy it out to some of our customer sites," he said.

Attendees also expressed their interest in moving to VPNs by visiting the show's Virtual Private Network Proving Ground, where Altiga, Shiva and other companies showed off their products. The tests were conducted by The Tolly Group on gear that uses the Internet as the backbone for secure WAN links.

The problem with the tests was that they varied from vendor to vendor. For example, one vendor tested for the number of simultaneous sessions its box can support, while another tested throughput but not simultaneous sessions.

So it was difficult to get oranges-to-oranges comparisons of products' capabilities. That shortcoming was compounded by the fact that most VPN gear is a grab bag of technologies, including everything from firewalls to authentication to encryption to routing.

Managing bandwidth

One of the toughest decisions attendees were grappling with was whether to just increase network bandwidth or to try to better manage the bandwidth they have.

In one session, "Policy Based Networking: Godsend or Boondoggle," boondoggle seemed to have the upper hand. Panelists from Cisco, 3Com and Nortel Networks described in exhaustive detail what it takes to implement a network in which devices, such as routers and switches, are able to recognize applications and users are able to give priority to the more important ones.

Moderator Eric Hindin, an analyst at The Yankee Group in Boston, seemed to summarize the concerns of many network managers in the audience when he suggested that it might just be less of a headache to simply add bandwidth rather than grappling with the complexities of setting up and enforcing these policies. ◪

Cisco CEO John Chambers preaches IP gospel.

VPN Proving Ground: Vendors test VPN mettle.

"We're moving from a circuit-switched to a packet-switched world," AT&T CEO Armstrong said.

PHOTOS: STAN BAROUH

Reporter's Notebook

COMNET/DC '99, WASHINGTON

Get a job

One of the most popular events at this year's show was the ComNet Career Fair, sponsored by *Network World*. Some 1,400 attendees exchanged resumes and networked with recruiters from 15 companies, including Nortel Networks, Fidelity Investments and General Electric. Fair attendees also got to be photographed atop a brand new Harley-Davidson motorcycle, leading one attendee to say he didn't care if he got a job, he just wanted the motorcycle. There was no word on whether he got either.

Wire, wire everywhere

Maybe it's the need to tie together all the new network equipment customers are buying. Maybe someone is building a big ball of string for his cat (see photo). Who knows? But cabling was a big issue at the show. For example, at the standing-room-only MT-RJ Consortium session, people were asking the burning questions of the day: "Will the cable color coding remain the same?" And, "Can I still use my connector faceplates?" MT-RJ is a new fiber-optic cable plug that closely resembles a traditional RJ-45 connector.

I feel your pain

It was arguably one of the most impassioned keynote addresses ever delivered. Folks were clappin', feet were stompin' . . . well, it seemed like they should have been. Of Cisco CEO John Chambers' speech, one congregation member said: "I'm surprised audience members didn't start throwing away their crutches during his speech."

Chambers urged users to throw out their PBXs and circuit-switched networks. "Voice will be such a small segment that carriers will throw it on the backbone and then give it away for free," Chambers said. He then asked the audience to heal the disease known as dinosaur syndrome — the inability to change.

On a personal note, Chambers detailed a Toyota 4Runner sport utility vehicle he bought online for his daughter. He lamented that he still had to visit the dealership to sign the final papers for insurance and financing.

Only in Washington

The Bill Clinton-Monica Lewinsky scandal came a little too close to home for some ComNet DC/'99 attendees. Those unfortunate enough to have rooms at the Mayflower Hotel were accosted by a horde of Monica-seeking paparazzi. Monica, in town for her Senate impeachment trial testimony, was staying at the hotel.

So many photographers were milling about outside that guests said they could barely get in or out the front door. And when they did, photographers would shout at them to get out of the way so they wouldn't ruin a potential shot of Monica.

Perhaps Monica grew tired of all the ComNet attendees and paparazzi, because she reportedly checked out and exited the hotel through a side door late Wednesday.

AP/WIDE WORLD PHOTOS

Nothing to see here

At least one little attendee was apparently not too worried about show security. She napped quite well amongst the throng, thank you. Others were not so relaxed. Security personnel combed the podium before Chambers' speech ("We always look around," one guard said.) Earlier in the week, a man crashed the exhibit floor gates claiming he was an exhibitor, but as guards approached him, he ran into the exhibit hall. No word on what ultimately happened to the guy. Rumor had it he just had to get his hands on a cable modem.

PHOTOS: STAN BAROUH

FCC,
continued from page 1

for RBOCs to sell network elements to competitive local exchange carriers (CLEC).

Last week's Supreme Court ruling, which overturns the appeals court decision, means users in many more markets may eventually enjoy local-service options from competitive carriers that haven't built complete local networks or still need key pieces to reach end users.The ruling was also vindication for FCC Chairman William Kennard, who was the agency's general council in 1997 when the appeals court threw out the rules.

Kennard: Vindicated.

But like most telecom-reform legal events, the ruling will probably not immediately change the environment for competitive local services. First, the FCC and the states will have to rewrite some of their rules to conform to the Supreme Court decision. Second, some clauses in interconnection agreements between RBOCs and CLECs may have to be renegotiated.

The issue before the Supreme Court was whether the FCC has the right to set national wholesale prices for local loops and other network pieces that new local carriers typically can't afford to build. Those national prices are not so much specific numbers as they are a methodology that forces RBOCs to determine costs based on current technology — not higher historical or "embedded" costs — to devise a wholesale price for network elements.

Writing for the majority in the 5-3 ruling, Justice Antonin Scalia cited the fact that the Telecommunications Act of 1996 is technically a series of amendments to the original Communications Act of 1934. The act authorized the FCC to "prescribe such rules and regulations as may be necessary in the public interest to carry out the provisions of the act." Leading the dissent, Justice Clarence Thomas stressed the state governments' historic role in setting local prices from the beginning of the Bell system. Justice Sandra Day O'Connor did not participate in the case because she owns AT&T stock.

The Supreme Court also ruled that new local carriers don't have to show that they have invested in something — a fiber loop or a telephone or data switch — to get the best available wholesale prices on everything else. RBOCs have complained that if every new carrier gets to cobble together a network based entirely on inexpensive RBOC piece-parts, the recent investment boom in new physical local networks will end.

Paradoxically, the ruling may ease pressure on the RBOCs in one key area: mergers. SBC Communications and Bell Atlantic have endured criticism for trying to reduce the number of potential competitors with their attempts to take over Ameritech and GTE, respectively.

Now the two super-RBOCs may be able to argue that local competitors have only themselves to blame if they fail to attack the local market. The Supreme Court's ruling may also aid the RBOCs' applications to enter the long-distance market if the ruling is viewed as resolving the local-competition debate.

In a related development, the FCC last week postponed ruling on whether RBOCs and other local carriers should be allowed to provide digital subscriber line (DSL) and other broadband services without the usual restrictions on local calling areas, and without being required to resell the services to competitors. ISPs had pleaded for the delay, saying DSL deregulation for RBOCs could put many small ISPs out of business. ◪

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Intel,
continued from page 1

client specification.

But no other companies have announced plans to release any new products based on the Intel specifications, and none have even revamped their existing thin-client lines.

Intel is turning more attention and resources to the much larger market for small products, such as handheld computers, personal digital assistants, smart pagers, Web phones and embedded systems. In these markets, Intel's Pentium-style chips will give way to the StrongARM microprocessor, acquired last May from Digital.

So why has the lean-client spec been such a dud? Most blame Intel for throwing old Pentium technology at a new market area. "There's really nothing to the lean-client guidelines.They use old PC technology that's been recycled," explains Michael Kantrowitz, executive vice president for Neoware, a King of Prussia, Pa., Windows terminal maker.

One chip expert agrees. "The Pentium is not a particularly good chip for thin clients, at least not on its technical merits," says Jim Turley, senior editor for "The Microprocessor Report," an industry newsletter."Chips with better price-performance are available from many other vendors."

Nevertheless, NCD agreed to create a Windows-based terminal based on the Intel products. Intel, in turn, poured money into the thin-client manufacturer. NCD has sold several thousand ThinStar 300 terminals since shipments began last December.

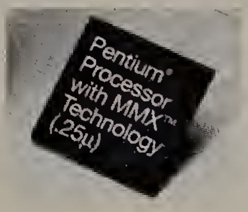
"Out of the gate, demand for ThinStar has been greater than for any other product in NCD's history," says James Fulton, NCD's vice president of product management. He cites two reasons: the reassurance of the Intel brand name, and ThinStar's management features, which make the devices easier for MIS managers to control.

This summer, IBM will release a high-end NC based on the lean-client guide. It will run the JavaOS for Business, which IBM is co-developing with Sun. But IBM wouldn't divulge any details of this addition to its thin-client line.

Intel's Ron Peck, who oversees the lean-client plan, says he's "relatively happy" with the company's success in a market that has not grown as fast as many analysts first predicted.

A tale of two chips

Intel's older Pentium chip for desktop thin clients has few buyers.



The older chips are targeted for use in network computers and Windows terminals.

But the StrongARM is a strong contender for new net clients.

It is ideal for a wide range of handheld devices, including personal digital assistants and Web phones.

"We're just trying to supply the underlying building blocks to the core thin-client vendors," he says. "We're tracking this market to see where it will go, to determine how much to turn up or down the energy we invest in it."

But some observers question whether PC-centric Intel is really sold on the thin-client concept."My gut feeling is that Intel will take a thin-client design win if it falls into their lap, but it isn't expending any effort to get there,"Turley says.

But Intel's interest perks up considerably when it comes to the information appliance market, a market that has little use for the battery-sapping Pentium line. "The Intel architecture is not a good fit for things like smart, handheld devices," says Len Wegner, marketing manager for Intel's StrongARM microprocessor group. "In these emerging markets, StrongARM is a super fit: it has lower power consumption, high performance and lower overall system costs.We're dead serious about StrongARM."

Hewlett-Packard popped a 190-MHz StrongARM CPU into its new Jornada 820 handheld PC, which operates up to 10 hours on a standard battery. That's more than three times the running time of a typical laptop PC.

But some observers doubt whether Intel can strong-arm its way into the appliance market. "Now that Intel has publicly stated it will promote StrongARM, we're still waiting for any evidence of this," Turley says. "The chips the company acquired from Digital are two years old — an eternity in this business."

Wegner says the company has created two StrongARM development teams to accelerate chip development, and plans to release new StrongARM products later this year. By May, Intel will outline its StrongARM roadmap. Work on the next version, StrongARM 2, began last summer.

Intel also is developing supporting software, services, technologies and standards for appliances.Among them is the Bluetooth standard, which specifies a wireless serial interface that allows small devices to communicate easily with each other and with desktop PCs or laptops. ◪

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Backspin

Jump on the serialized bandwagon

How about that? Intel on Jan. 20 announced that it will put readable serial numbers in all of its forthcoming Pentium III processors. Each chip will have a serial number "burned in" that can be read by applications. Not surprisingly, a furor has blown up over the plan.

What's all the angst about? Privacy. I talked to Barry Steinhardt, associate director of the American Civil Liberties Union, who believes serial numbers might become "the computer equivalent of Social Security numbers" and could be used to track people's online activities. But Steinhardt also says: "The point I've been trying to make is that this isn't a privacy Armageddon."

Steinhardt sees the Intel serial numbers as a potential problem rather than a de facto threat, and he's right. Without a lot more engineering aimed at taking advantage of the serial numbers, their mere existence is not particularly relevant. Steinhardt's concern is that the issue be addressed before it becomes a threat.

MARK GIBBS

Aha! The voice of reason. Steinhardt obviously understands that we have a long way to go to make the feature truly equivalent to a Social Security number.

But Intel's initiative has aroused the ire of many and, unfortunately, the shrill voices of the pop pundits know no bounds. The Electronic Privacy Information Center (www.epic.org), Junkbusters, Inc. (www.junkbusters.com), and Privacy International (www.privacyinternational.org) have banded together to boycott Intel products under the sobriquet of "Big Brother Inside" (www.privacy.org/bigbrotherinside).

While I applaud their enthusiasm in protecting our interests, I think these organizations are so premature in their desire to jump on a bandwagon that they look rather like rank publicity seekers. Frankly, I'm surprised that microprocessor vendors haven't implemented serialization sooner. In the mainframe, minicomputer and workstation worlds this is an old idea.

Lots of vendors have offered processor serial-number detection, and many application vendors have used it for software copy control.

But before we discuss the good, the bad and the self-serving, let's just take a quick look at how the system apparently works. As I said, the serial number is written into the chip during manufacturing so it can't be changed. It appears that to get the number, you'll access some kind of input/output port and read the 64-bit serial number value.

According to Chuck Mulloy, an Intel spokesman I interrogated recently, whether the port can be read depends on a "sticky bit." This sticky bit is a device onboard the processor that, when set, disables access. To reset the bit requires that the processor itself be reset. On reboot, an Intel software utility has to be run to switch the feature off.

My concern has nothing to do with privacy. Rather, there are a lot of very clever engineers and programmers out there who like nothing more than the opportunity to hack systems. If you don't think they'll come up with a piece of hardware or software that will allow your computer to lie about its serial number, then you really haven't been around the industry for long.

And then there's the fun to be had when a virus randomly switches off the feature. Then when some application tied to the serial number can't find it . . . .

I haven't had time to think through all the pitfalls, but I bet that you, gentle reader, have an even more devious mind than I (despite how evil my shades may make me look).

I think the serial number is a feature that is as dangerous as, say, the embedded and easily read Ethernet address on your PC. And who worries about that as a way of tracking people?

Concerns to nwcolumn@gibbs.com or on (800) 622-1108, Ext. 7504.

'NET BUZZ

CHRIS NERNEY

Armani, Karan, Xybernaut? *News item: In a Jan. 20 report, the Gartner Group has included wearable computers as one of the 10 technologies to watch in 1999 and beyond...*

"We're here today in beautiful Milan for the first techno-fashion show of the new season, along with dozens of editors from the top fashion and high-tech publications, including ***Computerworld, Women's Wear Daily*** and ***Peripherals Glamour.***

"For the paparazzi, this event is a feast of rare photo opportunities. Where else can one catch **International Data Group's Robert Metcalfe** huddled in animated conversation with the legendary **Bill Blass?** And over in the far corner, perpetually rumpled **Internet columnist Scott Bradner** can be seen trading fashion tips with **Brazilian designer Ocimar Versolato,** who appears to have fainted.

"Meanwhile, the first model is coming down the runway, sporting a fetching two-piece number from wearable computing pioneer **Xybernaut Corp.** Once again, Xybernaut appears to have shrewdly combined form and function with a sleek video display headpiece amusingly offset by a flared, belt-attached computer powered by a 233-MHz Pentium MMX processor.The Mobile Assistant IV also features an 11-inch mini-keyboard that you can strap on your wrist. Now that's accessorizing!

"Next up we have ViA II, which designer **ViA, Inc.** calls the smallest wearable PC on the fashion scene. Weighing only 22 ounces, ViA II is a full-function PC offering an optional 3.2 gigabit disk drive and a hot-swappable lithium ion battery. And when you're ready to slip into something more comfortable, the ViA II docking station magically transforms your wearable PC into a desktop computer.

"Coming down the runway now is a lovely model adorned with several new **Microsoft** creations, which unfortunately don't seem to work with anything else. . . ."

Making movie history. There have been many milestones in the history of movie watching. In 1895, a Paris audience viewed the first projected films. In 1934, a drive-in theater opened in Camden, N.J., charging 25 cents per person. In 1977, the first video rental store opened in Los Angeles. To this list we can add the presentation next Sunday of a full-length film over the Internet, an event being billed as the world's largest-ever multicast. The showing of the 1983 documentary *Koyaanisqatsi* is part of the third **IP Multicast Summit** in San Jose. The film's title means "life out of balance" in the language of the Hopi Indians. A few excerpts from online reviews:

". . . this unusual, lyrical film suggests that humanity is an ugly blight on the face of this beautiful planet." **(E! Online)**

". . . we see the ugliness in our society, a society that has created machines and technology to make life easier and is now held captive by the technology we created." **(EzyRyder, Internet Movie Database)**

Hmm. Multicasting a technology-bashing movie to the Silicon Valley set? There seems to be some irony afoot here.

The movie will be shown at the **DoubleTree Hotel** on two large and about 26 small screens, starting at 10 p.m. EST. But Internet viewers with service from any of the participating ISPs (check list at www.ipmulticast.com/events/summit99/_splash/splash-portal) and anyone whose ISP offers access to the Mbone can also tune in.

My mistake. Last week I wrote about executive search and staffing software start-up **PeopleMover** receiving $5 million in venture funding. In naming a couple of PeopleMover's original "angel investors," I somehow managed to turn two "r's" into a "v." PeopleMover early backer **Tom Fricks** is former chief information officer of temp staffing company Norrell Corp., not former CIO of that network operating system vendor in Utah. My apologies to Mr. Fricks and PeopleMover.

Send your best Internet news and fashion tips to Chris Nerney at (508) 820-7451 or cnerney@nww.com.

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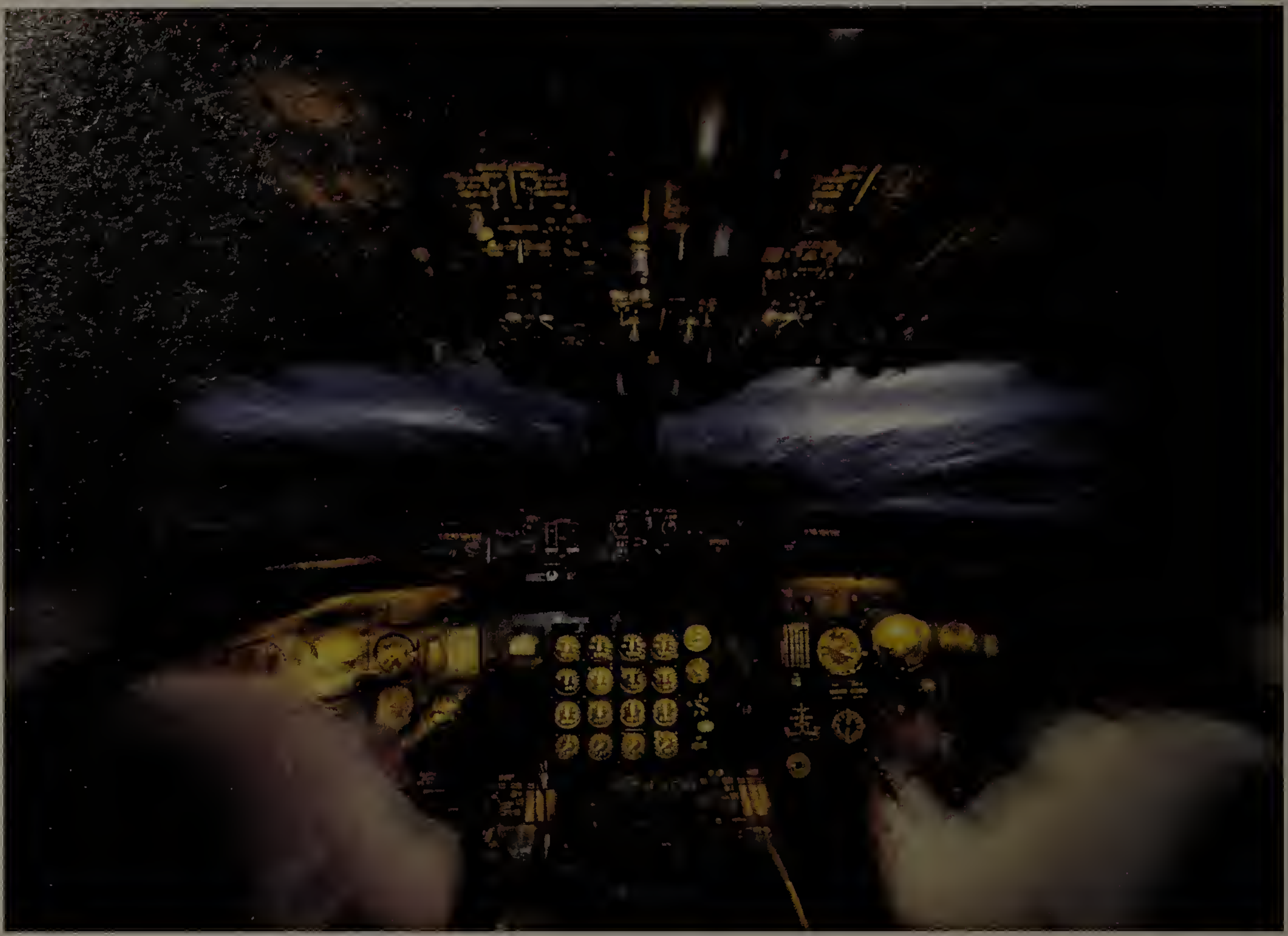

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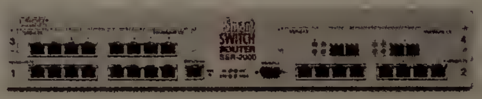

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